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THE RUBBER AGE

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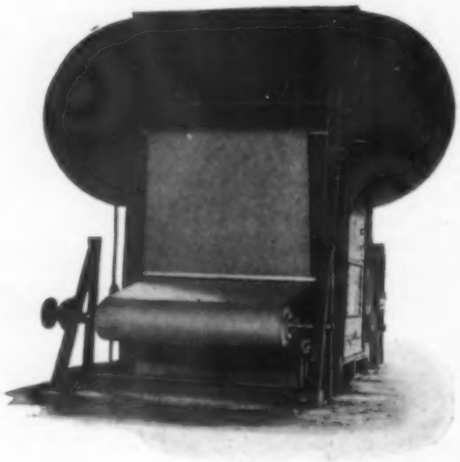

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Rubber Association's Foreign Trade Division Meets in Washington

Important Meeting Called on April 21, Eve of P. L. Palmerton's Departure for Europe on Export Investigation Mission Covering all Manufactured Rubber Goods

THE April meeting of the Foreign Trade Division of the Rubber Association of America, Inc., was held at the Department of Commerce, Washington, D. C., Friday morning, April 21.

Among those present were:

F. E. Titus, (Chairman of the Division), International B. F. Goodrich Corporation,
H. Braender, Braender Rubber & Tire Company,
Samuel Broers, Firestone Tire & Rubber Company,
A. G. Cameron, Goodyear Tire & Rubber Export Corp.

MESSRS HOOVER AND PALMERTON PHOTOGRAPHED WITH THE MEMBERS OF THE FOREIGN TRADE DIVISION OUTSIDE THE DEPARTMENT OF COMMERCE

Front Row, left to right: SAMUEL BROERS, Firestone Tire & Rubber Co.,; D. D. YARD, Pennsylvania Rubber Co.; C. E. WAGNER, Miller Rubber Co.; F. E. TITUS, the International B. F. Goodrich Corp., Chairman of the executive committee of the Foreign Trade Division; HERBERT HOOVER, Secretary of Commerce; DR. JULIUS KLEIN, Director, Bureau of Foreign and Domestic Commerce; A. L. VILES, general manager of The Rubber Association of America; and P. L. PALMERTON, Chief of the Rubber Division of the Bureau of Foreign and Domestic Commerce.

Back row, in order shown, left to right: E. G. HOLT, Rubber Division; ELMORE SALISBURY, Brunswick-Balke Collender Company; CHARLES E. SPEAKS, European manager, Firestone Tire & Rubber Co.; A. R. GORMULLY, Ajax Rubber Company; E. H. HUXLEY, United States Rubber Export Co.; G. S. GEORGE, Federal Rubber Co.; H. G. LUBKE, General Tire & Rubber Co.; E. C. CLARK, Hood Rubber Co.; K. S. CHAMBERLAIN, Fisk Rubber Co.; H. C. SPINDLER, Assistant Chief, Rubber Division; A. G. CAMERON, Goodyear Tire & Rubber Export Corp.; GEORGE FLINT, Rubber Association of America; G. E. MEURS, Miller Rubber Co.; A. J. WOLFE, Chief of Commercial Laws Division, Bureau of Foreign and Domestic Commerce; HARRY BRAENDER, Braender Rubber & Tire Co.; F. K. ESPENHAIN, Goodyear Tire & Rubber Export Corp.; L. A. MAYAN, Lee Tire & Rubber Co.

K. S. Chamberlain, Fisk Rubber Company,
E. C. Clark, Hood Rubber Company,
Frank K. Espenhain, Goodyear Tire & Rubber Export Company,
George S. George, Federal Rubber Company of Illinois,
A. R. Gormully, Ajax Rubber Company,
E. H. Huxley, United States Rubber Export Company, Ltd.
H. G. Lubke, General Tire & Rubber Company,
L. A. Mayan, Lee Tire & Rubber Company,
G E. Meurs, The Miller Rubber Company of New York,
P. L. Palmerton, Rubber Division,
Elmore Salisbury, The Brunswick-Balke-Collender Company,
Charles E. Speaks, Firestone Tire & Rubber Company,
H. C. Spindler, Rubber Division,
A. L. Viles, Rubber Association of America, Inc.
George Flint, Rubber Association of America, Inc.
C. E. Wagner, The Miller Rubber Company of New York,
Dudley D. Yard, Pennsylvania Rubber Company.

The meeting was called on the eve of P. L. Palmerton's departure for Europe, where as Chief of the Rubber Division of the Bureau of Foreign and Domestic Commerce, he will undertake the first market investigation covering the sale of manufactured rubber goods ever made by the Government on behalf of the rubber industry

Chairman F. E Titus, director of sales of the International B. F. Goodrich Corp., called the meeting to order at 9:30 and introduced Herbert Hoover, Secretary of Commerce, who welcomed the members to Washington and outlined the ideas by by which he had been guided in reorganizing the Bureau of Foreign and Domestic Commerce along lines that were calculated to be of more practical assistance to American business firms actively engaged in foreign trade.

Herbert Hoover's Address

Secretary Hoover spoke in part as follows: "The Department of Commerce is not a regulatory department. It is established for the purpose of promoting commerce. In working out a program by which we could be of real service, we decided as a first step that the work must be done in actual cooperation with the exporters, the American manufacturer who was in business abroad.

"There are a great many Government agents abroad engaged in the consular service and directly in the service of this Department whose purpose is to assist business, but very few of these men were experts in any one line. They simply looked for information which they thought would be of interest to the American public, and here it had been distributed by men who were not experts. And as a result, very little of it proved to be of any great purpose to the business public.

"We thereupon established the various commodity divisions in the Department with the several appropriations of Congress, with the idea that these commodity divisions should be created in cooperation with the industry itself. It was understood that in each case the industry was to be willing to appoint men actively engaged in the industry willing to come to Washington and plan definitely the campaign of this Department in connection with foreign commerce.

"Having been given a plan as to information and other helpful service that the Department could render, then when that material and its services are completed, we would have, through a special division devoted to the different commodities, a method for its redistribution back again in an intelligent fashion to the trades themselves. So that a necessary step in that whole program is the cooperation of the industries in some sort of a committee like this, who are willing to sit here in the interest of the industry and develop a method by which the Department can be of service.

Industries Should Benefit by Government Services

"I have this general feeling that unless the industries are prepared to take advantage of the situation and benefit by the great service that the Department can render, that unless they are prepared to take that interest and to devote a sufficient amount of time attending the actual cooperation, it is a practically useless effort on the part of the Government. I have not any notion that it is worth while for the Government to give its time and services unless they can be made of daily more practical purpose to the industry than they were before we started on this general campaign of reorganization.

"So this is the purpose for which you are here today, and we hope for your cooperation and we want to assure you that the whole reason you are here is because we are trying to build up the Government service and make it of actual, practical value in cooperation with business.

Dr. Julius Klein's Speech

Following Secretary Hoover, Dr. Julius Klein, Director of the Bureau of Foreign and Domestic Commerce, addressed the meeting, going into detail in his description of the ways in which the Bureau of Foreign and Domestic Commerce can be of practical assistance to American business. Dr. Klein emphasized the desire of the Department to get into closer contact with industry, and to make its service more practical, more of the dollars and cents character and less of the academic.

He recounted a recent incident in which a large corporation located in Boston, and whose business reaches into the millions, recalled their Spanish representative to get the solution of a very difficult problem regarding commercial laws, but found shortly afterward that the necessary information could have been secured in the Division of Commercial Laws of the Bureau which would have made the recalling of the representative from Spain unnecessary.

Dr. Klein observed that a good many people get the idea that it is the Department's purpose to boost foreign trade, whereas its real purpose is to build foreign trade on a sound foundation. It is just as much a function of the Department to advise certain manufacurers that they should not go into foreign trade or that they should confine their efforts to certain markets as it is to advise where this trade may be successfully undertaken.

He emphasized the necessity for following through export orders to see that they reach their destination satisfactorily, and brought out the thought that a careful study of the fundamental economic conditions of a given market is absolutely essential before inaugurating a sales campaign in that market.

Along these lines the general economic survey to be found each week in *Commerce Reports*, the Bureau's weekly publication, will be found most helpful. As every business man is interested in securing actual prospects for the purchase of his goods, he should find the trade opportunities appearing on the back pages of *Commerce Reports* in many cases of untold value. At this point Dr. Klein related several instances in which concerns have been known to build up profitable business merely by availing themselves of these actual sales opportunities.

Lewis Domeratsky, Assistant Director of the Bureau, followed Dr. Klein and described the very complete services which the Division of Foreign Tariffs was able to give the exporter. Beginning in a very modest way the Division of Foreign Tariffs has been developed until at present it is in position to supply authentic information regarding the tariff situation for any commodity in any country in the world.

A. J. Wolfe, Chief of the Division of Commercial Laws, indicated the lines along which his Division is serving exporting concerns. Shortly after its organization the Division of Commercial Laws completed a list of foreign law firms to whom American concerns may safely intrust their legal problems.

Although the Division of Commercial Laws is not an official collection agency, it has been in almost numberless instances able to render effective assistance to American firms along these lines. As trade disputes and controversies are not confined to domestic business alone, but quite frequently developed in foreign trade the Division of Commercial Laws is in position to render a much needed service in bringing the disputing parties together in such a way as to be satisfactory to both.

Mr. Wolfe emphasized the point that the Division of Commercial Laws has no legal status, but acts merely in an advisory capacity.

Following Mr. Wolfe, Eugene S. Gregg, Chief of the Transportation Division discussed those phases of the work of his Division which closely affected the work of the rubber goods exporters present. He indicated how the Transportation Division was gradually being put into position to assist those who were interested in doing so to make c.i.f. quotations, as well as to arrive at cost of goods laid down at inland points. Mr.

Gregg stated that the Bureau's work on export packing has been assigned to the Transportation Division and that this work was bringing forth considerable interest from exporters generally.

The Round Table Discussion

The meeting was then thrown open to a round table discussion led by P. L. Palmerton, Chief of the Rubber Division, in which the past work of the Division was outlined and its future plans presented together with a general statement concerning the things Mr. Palmerton's investigation in Europe might be expected to accomplish.

Mr. Palmerton indicated that while the industry generally had received the rubber goods monographs produced in his Division very enthusiastically, there are other publications of a more general nature gotton out by the Bureau which can be of great help to the rubber goods exporter, such as the various travelers hand books on foreign countries, as well as the general publications outlining the economic conditions of the countries with which they deal.

The European investigation which Mr. Palmerton is to undertake will consist of a study of the sales possibilities for American made rubber goods in the various European countries as well as a study of the European field as America's active competitor in rubber goods lines.

The meeting was then adjourned to the Hotel Washington where the regular business of the Foreign Trade Division was taken up.

It was the opinion among those present that the meeting in Washington proved very effective in establishing a closer contact with the Department of Commerce and particularly with the Rubber Division of that Department.

The Existence of Antimony Pentasulphide in Commercial Grades of Antimony Sulphuret

By D. A. Shirk and N. R. Wilson

THE use of antimony pentasulphide in one form or another in the vulcanization of rubber is almost as old as the vulcanizing process itself, having been brought into use in 1852, only thirteen years after Goodyear's discovery of the advantages of combining sulphur with rubber. But up to the present time there seems to be no record in the literature of the existence of a commercial grade of antimony pentasulphide of any degree of purity. In fact, there are statements which would tend to indicate that, as a commercial product, antimony pentasulphide does not exist.

P. W. Bridgeman[1] (See Reference) states, "It is not possible to produce an antimony pentasulphide which is even approximately pure. The pure substance probably does not exist but spontaneously decomposes into other sulphides and free sulphur. I have found the statement that under usual chemical methods of manufacture 40 per cent Sb_2S_5 is a high proportion." Kirchhoff[2] even goes so far as to say that in some grades at least antimony pentasulphide is conspicuous by its absence. Caspani[3] states that the essential constituent of the commercial orange product is a mixture of the antimony sulphides in which the combined sulphur fluctuates between 3 and 3.6 atoms of sulphur to 2 atoms of antimony. He also publishes the analyses of several different grades of antimony sulphides of which the following are typical.

English	
Free sulphur	17.9
Antimony	22.2
Sulphide Sulphur	10.3
Calcium Sulphate	50.4
	100.8
French.	
Free sulphur	7.3
Antimony	62.3
Sulphide Sulphur	27.5
Calcium Sulphate	3.2
	100.3
German	
Free sulphur	15.2
Antimony	54.7
Sulphide Sulphur	25.0
Calcium Sulphate	5.3
	100.2

On calculating the ratio of sulphide sulphur to antimony it is found from the above analyses that the value of x in the expression Sb_2S_x is for the English 3.49; French, 3.33, and German, 3.43. Or on calculating the respective percentages of antimony trisulphide and antimony pentasulphide in the above samples, the analyses appear as follows: (The method of calculation will be explained later in this paper.)

	English	French	German
Free sulphur	17.9	7.3	15.2
Antimony Trisulphide	23.7	73.7	60.5
Antimony Pentasulphide	8.8	16.1	19.2
Calcium Sulphate	50.4	3.2	5.3
	100.8	100.3	100.2

From these figures it becomes apparent at once that the pentasulphide is quite in the minority in the average grades of antimony sulphides. However, this does not prove that it does not exist in a high degree of purity, for it will be shown that it can be made to contain 90-95 per cent Sb_2S_5 and it can be obtained on a commercial scale containing 75-80 per cent Sb_2S_5.

Such a product has not had the attention of the rubber trade until recently because of the fact that it has been impossible to prepare it in such a state of division that it could be successfully incorporated in a rubber mixture and at the same time possess the chemical and physical stability necessary to withstand the conditions of vulcanization. However, these difficulties have been recently overcome and the product is giving excellent results in the rubber industry, inasmuch as this product has an obscuring power, i.e., a fineness of division, equal to that of gas black which is far superior to the ordinary rubber fillers. Furthermore, this quality is not obtained at the expense of color stability for its ability to withstand the conditions of vulcanization is greater than other grades containing lower percent of Sb_2S_5.

Analyses of three different samples of this material will be described. Quantitative determinations were made for the following constituents; Free Sulphur, Antimony, Total Sulphur and Non Volatile Matter.

Methods of Analysis

Free Sulphur—This was determined by weighing one gram of the sulphide into a 100cc Erlynmeyer flask and covering with about 30cc of freshly distilled carbon bisulphide and allowing this to soak for three hours at room temperature. It was then filtered and washed into a weighed dish and the carbon bisulphide evaporated on a steam bath and the remaining sulphur weighed.

Antimony—This was determined by titration with Iodine of a hydrochloric acid solution of the fused sample (See Scott[4]).

Total Sulphur was determined by oxidation to H_2SO_4 and precipitation as $BaSO_4$ (Scott[5]). The total sulphur minus the free sulphur is considered as sulphide sulphur.

Non-Volatile Matter

A one gram sample of the sulphide was weighed into an evaporating dish (2 in. in diameter) and mixed with about 3

grams of ammonium chloride; another three grams of ammonium chloride were used to blanket the mixture and the dish heated over a gas jet until all volatile matter was driven off. The dish was then cooled and a few drops of HCL added to free any occluded antimony. This was dried over a gentle flame and another blanket of ammonium chloride placed over it and heated again. When this was volatilized, the dish was again cooled and a few drops of H_2SO_4 added and the dish heated to constant weight. The increase in the weight of the dish and contents minus the predetermined weight of non volatile matter in the ammonium chloride is reported as non volatile matter of the sample.

The results of these analyses are as follows:

	No. I	No. II	No. III
Free Sulphur	1.20	6.5	8.0
Sulphide Sulphur	38.00	34.5	33.8
Non Volatile	1.60	2.5	5.8
Antimony	58.72	55.12	54.28
	99.52	98.62	101.88

Method of calculation of Sb_2S_3 and Sb_2S_5.

The per centages of Sb_2S_3 and Sb_2S_5 are obtained from these analyses by solving two simultaneous simple equations. The method will be illustrated on sample No. I.

Let x = % Sb_2S_5 in the sample
y = % Sb_2S_3 in the sample

Then x + y + Free Sulphur + Non Volatile = Approximately 100. in this case:—

$$\text{I. } x + y + 1.2 + 1.6 = 99.52$$

Also:

$$\text{Pure } Sb_2S_3 = 60.0\ \%\ Sb = \frac{240}{400}$$

And

$$\text{Pure } Sb_2S_3 = 71.4\ \%\ Sb = \frac{240}{336}$$

Therefore

$0.6Sb_2S_5 + 0.714\ Sb_2S_3$ = Total Antimony in the sample.

Or

$$\text{II. } 0.6x + 0.714y = 58.72$$

So we have in this case:—

$$\text{I. } x + y + 1.2 + 1.6 = 99.52$$

$$\text{II. } 0.6x + 0714y = 58.72$$

Solving for x in I. $x = 96.72 - y$.

Substituting x in II. and solving for y:—

$$0.6(96.72 - y) + 0714y = 58.72$$

$$y = \frac{0.69}{0.114} = 6.05\%\ Sb_2S_3$$

Substituting this value in I.

$$x = 90.67\%\ Sb_2S_5$$

Thus the three samples are shown to consist of the following:

	I	II	III
Sb_2S_5	90.67	77.77	75.63
Sb_2S_3	6.05	11.85	12.45
N.V.M.	1.60	2.5	5.80
Free Sulphur	1.20	6.5	8.00
	99.52	98.62	101.88

As a check on the above analyses and also to show that the surphur which is considered as being combined with pentavalent antimony does not exist as free sulphur insoluble in carbon bisulphide but is actually sulphide sulphur, the following determinations were made.

A sample of each No. II and No. III was dissolved in concentrated HCL, which, as is well known, reduces the pentavalent antimony to the trivalent according to the following equation:—

$$Sb_2S_5 + 6\ HCL = 2\ SbCl_3 + 3\ H_2S + 2\ S.$$

The precipitated sulphur together with the original free sulphur was filtered and washed free from the antimony chloride and acid and after drying, the sample was analyzed for free sulphur according to the previously described method. It will be seen from the above equation that this additional sulphur should amount to 16 per cent of the original pentasulphide dissolved. Therefore, in No. II there should result:—

$$0.16 \times 78.2 = 12.5\%\ S_2$$

Plus original free sulphur 6.5%

19.0%

equals the theoretical amount of free sulphur which should be obtained. The actual analyses showed the total free sulphur soluble in carbon bisulphide after treatment with HCL to be 18.7%. On sample No. III a still better check was obtained. By the same reasoning as above this should show 20.1 per cent free sulphur whereas 20 per cent was obtained by analyses. We can only conclude from the above that the assumption is correct; that the total sulphur minus the free sulphur is sulphide sulphur in combination with antimony and that the proportions stated in the analyses correspond to the formula Sb_2S_5.

As a further check on the same point, a separate sample of each, No. II and No. III was heated for 4 hours at 50 deg. steam pressure to effect the complete decomposition of the Sb_2S_5 according to the equation:—Sb_2S_5 + heat = Sb_2S_3 + 2S. It might be well to point out here that a large number of tests of this nature have shown:—

1. That no sulphur is liberated from Sb_2S_5 without a distinct color change.

2. That for a given sample the amount of sulphur liberated by the heat decomposition of Sb_2S_5 is roughly proportional to the color change.

3. Complete decomposition of the Sb_2S_5 to Sb_2S_3 is obtained only when the sample undergoes a complete color change from the orange-red to black.

After heating to complete decomposition these samples were analyzed for free sulphur soluble in carbon bisulphide and it is sufficient to say that the results obtained substantiated the conclusions already drawn from the preceding tests.

SUMMARY

1. Several references to the literature on Antimony Pentasulphide are cited.

2. Comparative analyses of four grades of Antimony Sulphides are given.

3. A method of calculating the per cent Sb_2S_3 and Sb_2S_5 in the same sample is described.

4. A commercial grade of Antimony Sulphide containing 75-90 per cent Sb_2S_5 is described.

REFERENCES

1. P. W. Bridgeman — Proceedings American Academy of Arts and Sciences. 52-1916 Pp91-187
2. Kirchhoff — India Rubber World, March 1, 1922. Pp 444
3. Caspani, W. A. — India Rubber Laboratory Practice 1914 Pp 74
4. Scott, W. W. — Standard Methods of Chemical Analyses. 1918. Pp 19 and 27.
5. Scott, W. W. — Standard Methods of Chemical Analyses. 1918. Pp 396

Tire Varnish

A mixture, containing zinc white mixed in the desired proportions with lampblack, which is then admixed with a solution of one part by weight of rubber solution and four parts by weight of benzine, will give a very good varnish to be used in painting tires a dust gray color. The varnish can be applied with a brush readily.

Elastic Sulphur

A method of forming elastic sulphur by the action of a concentrated solution of nitric acid on hyposulphite of soda is described in the Kolloid Zeitsch, volume 28, page 126. This product is obtained by the treatment of 150 parts of sodium hyposulphite in a finely ground condition in an evaporating dish with 70 parts of nitric acid. The reaction takes place very quickly with the evolution of considerable oxide of nitrogen fumes and sulphur dioxide. At the end of the reaction, water is added, the elastic sulphur is removed and washed with hot water.

ABSTRACTS

Technical — General — Commercial

Dry Separation of Rubber and Fiber

In reworking old rubber tires, belts and other rubber articles, in which rubber has been used in conjunction with fiber and fabric of various sorts, as well as in processing uncured cord-tire scrap, friction scrap, etc., there have been used up to the present time two general methods, one which made use of chemicals, which usually result in the destruction of the fiber, and other, the wet mechanical method, which required the troublesome and expensive drying of the material after it was recovered. The present process, which is patented in the United States and assigned to the B. F. Goodrich Co., (see United States Patent No. 1,401,795) has for its object the separation of the rubber and fiber in the dry state, without the use of water or chemicals, thus avoiding the disadvantages of the other two methods.

The scrap material is first broken up in a machine, known as a shredder. This consists of a rapidly rotating rotor, provided with a series of pivoted flails, arms or hammers which cooperate with a number of transverse stationary bars or knives to tear the material apart. These knives are arranged on a grating which acts as a sort of screen, for as soon as the materials have been shredded finely enough they fall through the grating into a chamber underneath. From this chamber these fine particles of rubber and fiber are blown through a large pipe by means of a fan blower into a separating chamber. This chamber is rectangular in form and the materials enter it at the top with a downward direction. In the lower part of the chamber there are a number of rotary paddles or agitators which serve to stir up the rubber particles so as to assist in liberating the loose fiber.

The floor of the chamber has a relatively large opening, directly under which there runs an endless belt conveyor, which leads away the particles of rubber that fall upon it. At the top of the chamber there is a large discharge pipe which is provided with a pivoted valve or damper. The air current blows the fine particles of fiber, which are much lighter than the rubber particles, through a cyclone separator, in which the particles are separated from the air current, which is exhausted into the atmosphere. The fine particles of fiber drop down into a hopper from which they are transferred into barrels.

Vulcanizing India Rubber

Rubber is mixed with a vulcanizing ingredient, the mixture is then treated with a substance which is adapted to permeate it and the treated mixture is finally vulcanized. Numerous examples are given in the specification (British Patent No. 174,915). The following is typical. One hundred parts of rubber, 10 parts of zinc oxide, 6 parts of oxybutyl-thio-carbonic acid disulphide and 3 parts of sulphur are compounded to form a homogeneous mass. A second stock consists of 100 parts of rubber, 10 parts of zinc oxide, 3 parts of sulphur and 4 parts of aniline. These stocks are blended, for example, by passing through mixing rolls or by superimposing thin sheets, and articles made therefrom are completely vulcanized in a week at 70 deg F. Heat may be applied to shorten the vulcanization process, but in this case the mixing should stand for a day to allow the vulcanizing ingredient to permeate the whole. The first stock may be merely exposed to aniline or a stock containing aniline may be formed into articles which are then painted with butylthiocarbonic acid disulphide. For oxybutylthio carbonic acid sulphide may be substituted oxyethyl, oxyamyl, oxymethyl and like compounds, acetyldisulphide, benzoldisulphide and dithiobenzoldisulphide, or the following xanthogenates, namely mercuric ethyl, potassium amyl, zinc amyl, copper ethyl, zinc ethyl, barium ethyl, sodium methyl, lead methyl, zinc methyl, lithium ethyl, magnesium ethyl, calcium ethyl, potassium butyl and others. Aniline may be replaced by other amines such as ethyl amine or paratoluidine. The whole of the ingredients in the example given are not essential for carrying out the process. When zinc butyl xanthogenate is used, zinc oxide is not necessary, aniline and sulphur alone are necessary, or the aniline may be omitted and the vulcanization carried out in the presence of zinc oxide and sulphur alone. Oxybutylthiocarbonic acid disulphide alone in sufficient quantity is a vulcanizing agent.

Oil from Rubber Seeds

Four years after being planted, the rubber tree bears seeds for the first time, and after the tree is eight years old the production of seeds becomes regular. These seeds are made up approximately of 50 per cent shell and 50 per cent of kernel. The kernels are removed and dried in the air. Such air-dried kernels are found to contain on the average about 45 per cent of an oil which possesses the following properties.. Its density is 0.924 at 15 degrees C, its acid number 10.7 to 56.4, its saponification number 185.6 to 193.4 and its iodine number 121.2 to 143.4. The high saponification and iodine numbers of this oil indicate that it can be used in the manufacture of soap and linoleum products. The oil will harden and hence it may be used either alone or in admixture with other drying oils in the manufacture of paints, laquers and varnishes. For further details see Gummi Zeitung, volume 35, page 500.

Artificial and Natural Rubbery Compositions

The mass that is to be vulcanized is admixed with metallic oxides and superoxides or such compounds either of an inorganic or organic nature, which liberate part of the oxygen, that they contain in their molecule, at the temperature at which vulcanization takes place. In addition to these compounds there are also added amines or ammonia compounds of either an aliphatic or aromatic nature, or their derivitives and salts. Either synthetic isoprene or erythrene rubber or recovered rubber may be used as well as raw rubber. The product is a vulcanizate which is soft, elastic, possessing great strength and extensibility. (See German Patent No. 328,610)

Fillers for Soft and Hard Rubber Compounds

The Farbenfabriken vrom. Frisderich Bayer & Co. has been granted a patent on the addition of certain substances of an oily or resinous nature to soft and hard rubber compositions. (see German Patent No. 303,224). These products are made by the condensation of Aralkyl halogenides or of the higher halogenated derivatives of benzol homologues, such as benzyl chloride, xylyl chloride and para-xylylene-dichloride with naphthalene and its derivatives or tar oils. In the place of tar oils there may be used such substances as phenanthrene, anthracene, xylol, benzol, toluol, cymol and solvent naptha.

Regenerating Vulcanizer Rubber

In Dutch Patent No. 6256, which is assigned to the Naamlooze Vennootschap Nederlandsche Maatschappij tot Exploitatie van Optimietfabrieken, there is described a process of regenerating rubber, which consists in first grinding up the product to as fine as possible a state of sub-division. The rubber is then dissolved in as little as possible a quantity of a vulcanizable oil, such as linseed oil. Then the solution is converted in a rubbery mass by vulcanization in the hot with the necessary amount of sulphur.

Vulcanization Accelerator

An accelerator of vulcanization is made by treating burnt magnesia with a strong solution of Alkali, whereat with vigorous agitation, the magnesia is converted into a dry white powder. The addition of alkali serves to increase the accelerating powers of the magnesia. (see German Patent No. 344,061)

The Use of Magnesia in the Rubber Industry

The Oxides and Carbonates of Magnesia have Been known as Rubber Compounding Ingredients for Many Years -- Magnesium Oxide Compared with Other Inorganic Accelerators

By A. H. Smith

BOTH the oxide and carbonate of magnesia have been used in rubber compounding for many years. The rubber industry, however, has been slow to adapt these materials to its uses, and, even at the present date, their consumption by the rubber trade is relatively small.

The oxide or calcined magnesia was first to be used, very little of the carbonate being used until recent years. H. C. Pearson, in a book on Rubber Compounding Ingredients, published first in 1899, gives a very brief description of calcined magnesia and merely mentions the occurrence of the native carbonate. He states that a very small quantity of calcined magnesia is used in insulated wire, for the purpose of increasing the toughness and hardness of rubber compounds. Nothing is said about its accelerating the rate of vulcanization.

There are several types of magnesium carbonate employed in the rubber industry. Magnesium carbonate is a very light, fluffy, white material, having an actual specific gravity of 2.20. Because of its bulkiness, it seems much lighter. The actual content of magnesium carbonate runs well over 90 per cent, the chief impurities being calcium, aluminum, silica and iron, which ordinarily are present in decreasing amounts corresponding to the order named. It is not a true or normal carbonate, but is what is known as a basic carbonate. This means that it contains chemically combined water of hydration. Accordingly it reacts slightly alkaline.

Calcined magnesias are prepared by prolonged but gentle heating of either the precipitated or natural carbonate. They are all white in color, and have a specific gravity of about 3.30. Their apparent gravity varies enormously and because of this they are generally graded into heavy magnesia, light magnesia and extra light magnesia. The difference in bulkiness is caused by differences in manufacture, the chief variation being the difference in bulkiness of the carbonates which are calcined. Carbonates precipitated from a hot solution are relatively dense and give heavy oxides on calcination, while those precipitated cold give lighter products. Other variations are also introduced. A barrel of extra light calcined magnesia weighs only 50 pounds. The impurities in the oxides are of the same general nature and magnitude as in the carbonate. Ignition loss is about 4 per cent.

If we mix one hundred parts of wild or plantation rubber with ten parts of sulphur and heat this mixture for three hours at a temperature corresponding to a steam pressure of 40 pounds, we will get a product quite similar to the rubber you find in the ordinary elastic band. Obviously this type of rubber is not suitable for tires, boots, mechanical rubber goods, etc., and, furthermore, it is not economical to heat or "cure" articles for three hours. Magnesia is used to hasten the cure, and also to impart stiffness to the compound. These are the two fundamental uses of magnesia in rubber.

In general there are several reasons for compounding rubber. We usually wish to speed up the "cure;" we may desire to cheapen the finished product by the addition of cheap filling material; we may wish to make the product extremely hard and stiff. Sometimes it is compounded to withstand abrasive wear; again it is compounded to resist heat, or it may be compounded to withstand repeated flexing. Other variations produce extremely tough rubbers and still others produce materials which will resist the deteriorating effect of the elements.

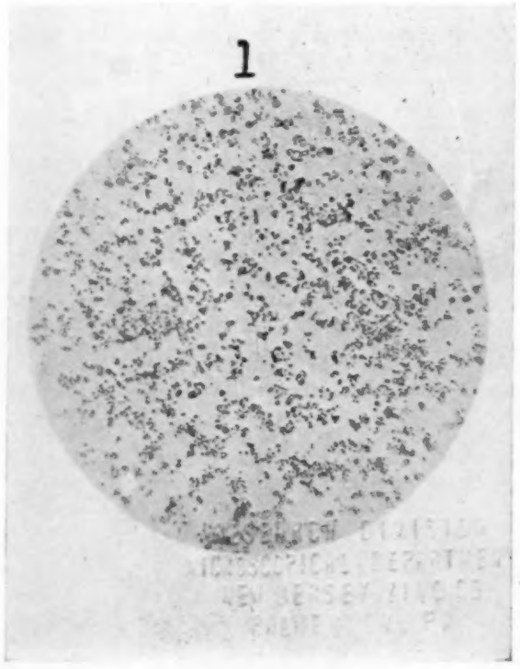
Magnesia, both carbonate and calcined, is used in rubber compounding for several reasons.

Carbonate of magnesia can be used in considerable quantity in a rubber mix. Since it is slightly basic it accelerates the cure in a small degree. The pigment remains white during vulcanization, but because of its relative coarseness of particle, it cannot be used as a coloring material for white compounds. It does not impart any added tensile strength to rubber, but does stiffen it to a marked degree. In conjunction with zinc oxide or gas black, it produces a tough, stiff compound suitable for use on a tire tread or for truck tires. It is quite widely used in Europe for this purpose. It is said to increase the abrasive resistance of a rubber stock containing it, but for this purpose, not over 10 per cent should be used, and the compound should also have considerable amounts of zinc oxide and gas black.

Calcined Magnesia Accelerates Cure

The primary use of calcined magnesia in rubber is to accelerate the cure. A secondary use is to dry up and stiffen compounds containing considerable resinous or bituminous material. The use of magnesia is somewhat precarious, either too much magnesia, or too much sulphur will give a stock which will overcure and harden up on standing, and thus magnesia is said not to "age well." In this respect, litharge is more easily handled and is therefore preferred in most all goods except those in which the black color produced by litharge is objectionable. Because of this drying up on age, magnesia can be used in the ordinary soft rubber compound only to the extent of 1.5 to 2 per cent of the weight of rubber. If sulphur content is made very low, this may be increased to 3 per cent, and for semi-hard packings and hard rubber even this figure may be increased.

Since magnesia does not melt down and dissolve in the rubber, its effect as a catalyst must depend upon surface contact. Therefore its accelerating action is roughly in proportion to the surface exposed. Obviously, the finer the oxide (calcined magnesia) used, the more surface per unit weight and the less material required for a given accelerating action. Thus it is seen that rubber manufacturers want magnesia finely divided, and of a uniform state of division.



ZINC OXIDE, 800 DIAMETERS

Reprinted from Asbestos for April.

CATALPO CLAY, 750 DIAMETERS

The one chief feature in all rubber compounding work is the fineness of particles of the various ingredients. Ordinarily magnesium carbonate is a relatively coarse pigment when compared to others used in rubber; heavy oxide is very coarse; lighter grades of oxides are considerably finer; in general the fineness increases as the apparent density of the oxides gets lighter, although this is not always true.

As an illustration, note Figures I, II and III. Figure I is a photomicrograph of commercial zinc oxide (one of the major constituents of rubber compounds, especially in tire work) at 800 diameters. Figure II shows clay at 750 diameters. Figure III is a section of a tire tread, containing heavy calcined magnesia, also at 800 diameters. The two large lumps show the relative coarseness of heavy magnesia. The fineness of other grades of magnesia vary all the way from these coarse particled products to products in which the average particle size is but twice that of the zinc oxide shown.

Let us compare the effect of magnesia oxide with other materials when used to accelerate the cure of rubber.

Other inorganic accelerating materials used are litharge and other lead compounds, antimony sulphide, lime and caustic. The more common organic accelerators are thiocarbanilide, hexamethylenetetramine, anhydroformaldehyde-aniline, aniline, par nitrosodimethylaniline, aldehyde ammonia, di and triphenylguanidine, para pheylenediamine and others.

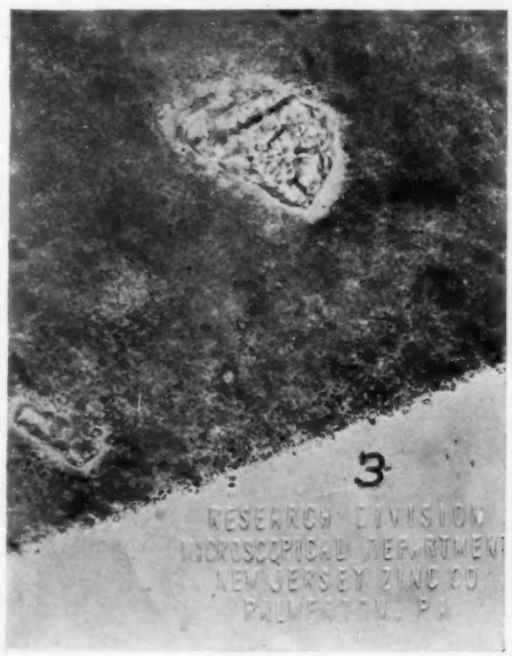
Organic accelerators, in general, evolve more or less gas and cannot be used except for molded goods. Magnesia and other inorganic accelerators can be used for curing without pressure. Magnesia is without effect in dry heat cures in the absence of moisture.

Comparing the inorganic accelerators, we arrive at the following conclusions: Caustic is very little used as an accelerator because goods containing it do not age well. Its action is rapid. Lime is perhaps the next least used in soft rubber goods, though it is used more in hard rubber, and in stiff mechanical goods. Its action is also very rapid. Lime is a very cheap accelerator, but does not find preference in rubber work. Antimony sulphide is an excellent accelerator, slow in action, but is expensive to use. It is more largely used for its pigmenting action, as it gives a decided orange-red color to rubber compounds containing it. Red oxide of lead is no longer used as it tends to act as a catalyzer and cause oxidation of the rubber. Litharge is the most widely used of all. It has the objection that it can be used only in black or dark-colored objects, since black lead sulphide is formed during vulcanization. Magnesia here has an advantage as it does not darken. Another objection to litharge is its high volume cost, largely caused by its specific gravity of 9.30. Its action is rapid and good cures can be obtained in a few minutes. Other lead compounds, such as sublimed white lead, sublimed blue lead and basic white lead, act as accelerators in a lesser degree. From three to six parts by weight of litharge are necessary to cause as much acceleration as one part of magnesia. All inorganic accelerators, antimony excepted, work so rapidly that they are apt to start the vulcanization process during factory operations, chiefly milling and calendering, and the stocks in which such action is started are said to be "scorched" or "burned".

Few Organic Accelerators Are Quick Acting

Few of the organic accelerators are quick acting. Only those of the thio-urea type, such as thio carbanilide, can really be compared to magnesia. Thio carbanilide or other thio ureas will give cures in a few minutes. About five times as much thio carbanilide is used as would be needed of magnesia. Such a stock also has a tendency to "scorch". When vulcanized it has an extremely snappy feel and is unusually lively and elastic. This is one chief advantage in the use of accelerators. Another is that their use increases the tensile strength of the compound over that obtained with litharge or magnesia. A third great advantage is that by the choice of the proper organic accelerator, the speed of the vulcanization can be varied more easily than with litharge or magnesia. The other organic accelerators mentioned are slower in action and they take a place in rubber work in which they can hardly be compared to magnesia.

Gas black or carbon black is a new material in the rubber industry. It imparts extreme stiffness in a stock, combined with added tensile strength and abrasive resistance. Magnesium carbonate adds stiffness to a compound but does not give good tensile strength. When used in large amounts it makes a stock seem extremely dry. The best way to use it to stiffen a high grade compound is in conjunction with zinc oxide and gas black. Zinc oxide gives good tensile strength, but imparts very little stiffening action. So by the addition of both zinc oxide and magnesium carbonate, we can get both strength and rigidity. A stock grade of china clay also imparts considerable stiffness to a stock. The more mineral fillers added to a compound and the greater the degree of vulcanization, the harder and stiffer the compound will be. These two factors are much more important than the compounding material itself.



SECTION OF TIRE CONTAINING LARGE LUMP OF CALCINED MAGNESIA

List of Rubber Heel Manufacturers Showing Extent of the Industry

ONE line of business in the rubber trade that has kept good right through the depression and has even developed considerably is the manufacture of rubber heels. The extent of this division of the industry is not realized by all in the trade, and we are pleased to present herewith a list of heel manufacturers, which is substantially complete, and for which we are indebted to George A. Stetson, secretary of the Rubber Heel Club of America, Boston, Mass.:

Armstrong Cork Co., Lancaster, Pa.

Automatic Heel Co., 617 Albany St., Boston, Mass. *Brand*—Automatic Cushion, Automatic Quality, Parker Quality.

Avon Sole Company, Avon, Mass. *Brand*—Du-Flex.

Beacon Rubber Co., 149 Commercial St., W. Lynn, Mass. *Brand*—Beacon.

Boston Woven Hose & Rubber Co., Boston, Mass., P. O. Box 5077. *Brand*—The Heel of Quality, Wauklite Heel.

Cambridge Rubber Co., Cambridge, Mass. *Brand*—Cameo.

Climax Heel Co., Mt. Jewett, Pa.

Consolidated Rubber Co., Elyria, Ohio. *Brand*—Shoemakers Quality.

Dryden Rubber Co., 1014 S. Kildare Ave., Chicago, Ill. *Brand*—Dryden Double Wear, Nu-Step.

Elyria National Rubber Heel Co., Elyria, Ohio. *Brand*—National.

Emery Heel Sales Co., 232 Purchase St., Boston, Mass. *Brand*—Emery.

Essex Rubber Co., Trenton, N. J. *Brand*—Tite-Edge & Essex.

Federal Rubber Co., Cudahy, Wis. *Brand*—Rugged & F.R.C.

Fellsway Rubber Co., 232 Purchase St., Boston, Mass. *Brand*—Travelite & Walkmore.

Foster Rubber Co., 105 Federal St., Boston, Mass. *Brand*—Foster, Cat's Paw, Tredair.

Firestone Tire & Rubber Co., Akron, Ohio. *Brand*—Firestone.

Goodyear Tire & Rubber Co., Akron, Ohio. *Brand*—Goodyear-Wingfoot.

Granger Vacuum Rubber Heel Co., Cleveland, Ohio. *Brand*—Doe Boy.

Hanover Rubber Co., West Hanover, Mass. *Brand*—Nu Life, Pli-Lite.

Hazen-Brown Co., 727 Atlantic Ave., Boston, Mass. *Brand*—Safeheel.

Hill Rubber Heel Co., Elyria, Ohio. *Brand*—Air-Cushion.

Holtite Manufacturing Co., Inc., Baltimore, Md. *Brand*—Holtite, Jax.

Hood Rubber Co., Watertown, Mass. *Brand*—Hood-Arrow.

I. T. S. Rubber Co., Elyria, Ohio. *Brand*—I.T.S.

Huntington Rubber Mills, Portland, Oregon. *Brand*—Huntington Non Skid Heel.

Jones Never-Loosen Rubber Heel Corp., N. Y., City. *Brand*—Jones Never-Loosen Non Slipping Rubber Heel.

Killion Rubber Co., 26 Clayton St., Dorchester, Mass. *Brand*—Killion, Dreadnot.

Keistone Rubber Co., Inc., Warren, R. I. *Brand*—Capitol.

Marathon Company, Cuyahoga Falls, Ohio. *Brand*—Marathon, Victory.

Meade Rubber Co., Stoughton, Mass. *Brand*—Cushion Cumfort Triangle, Cushion Tread, Cushion Kumfort, Paramount Live Thread Heel.

Robert E. Miller, Inc., 11 Broadway, N. Y. City. *Brand*—U-Put-On, Diamond Grip.

Morrison Rubber Co., Stoughton, Mass. *Brand*—Morrison Cushion Heel.

O'Sullivan Rubber Co., Inc., 131 Hudson, N. Y. City. *Brand*—O'Sullivan's.

Panther Rubber Mfg. Co., Stoughton, Mass. *Brand*—Panther Secop Tiger Tread.

Pietzuch Arch Guide Heel Co., Cincinnati, Ohio. *Brand*—Pietzuch's Wonder Arch Guide Heel.

Plymouth Rubber Co., Canton, Mass. *Brand*—Plymouth, Norfolk, Slipknot.

Pneumatic Rubber Heel, Inc., 89 Walker St., New York City. *Brand*—Sorelle Quality Rubber Heel, Sorelle Pneumatic Heel.

Quabaug Rubber Company, N. Brookfield, Mass. *Brand*—Armortred.

Simplex Rubber Co., 65 Broad St., Boston, Mass. *Brand*—Super Six, Flexrite, Sterling, De Luxe, Simplex Shock Absorber.

Surefoot Heel Co., Gettysburg, Pa.

Taunton Rubber Co., Taunton, Mass. *Brand*—Columbia, United, Peerless.

Tee Pee Rubber Co., 350 Madison Ave., N. Y. City. *Brand*—T.P., Wilkie, Peecnaker.

United States Rubber Co., 1790 Broadway, N. Y. City. *Brand*—Springstep.

The Vul-Tex Co., Barberton, Ohio. *Brand*—Vultex, Pathfinder, Akron.

Weartex Co., Trenton, N. J.

Frank W. Whitcher Co., 10 Albany St., Boston, Mass. *Brand*—Velvet, Winner, Tru-Fit.

The Wids Co., Charles River, Mass. *Brand*—Wids Service Heels.

The Willis Rubber Products Co., Elyria, Ohio. *Brand*—Acco, Fether Tred.

Rubber Heel Manufacturers making no Special Brand, but making certain types for the shoe manufacturing trade

B. F. Goodrich Co., Akron, Ohio.
Alfred Hale Co., Atlantic, Mass.
N. Y. Belting & Packing Co., New York City.

Joining India Rubber Tubes

In an apparatus for joining india rubber tubes, the mandrel or mold or both are constituted of a flexible container which is filled with a fluid or a solid which will flow, such as sand, so as to distribute the pressure equally. The tube, whose ends are to be joined, is passed through and bent back over a split, hollow, flexible mandrel which is supported by a rigid ring and is filled with the pressure fluid or a solid like sand or small shot. The joint is made and a split mold capable of being heated is applied. For further details see British Patent No. 174,725.

Goodyear Vice President Sees Revolution in Advertising

G. M. Stadelman, vice president of the Goodyear Tire & Rubber Co., Akron, Ohio, in a symposium of progress in advertising published in the April issue of *Associated Advertising* says:

"The past twenty years have seen a veritable revolution in advertising.

"It has seen the technique of advertising come into being, and advance with great strides. It has seen the morale and morals of advertising reach and maintain themselves on as high a plane as those of any other business or profession today.

"But advertising has only started on its way. From a somewhat doubtful occupation, it has become the studied and honored profession of careful, clear thinking men. And it will go on in its development until its rules and maxims have become close to a science.

"With such organizations as the Associated Advertising Clubs of the World, The Audit Bureau of Circulations, the Association of National Advertisers, Inc. and the advertising press to point the way, advertising cannot go back. It must go forward swiftly.

"In the last twenty years advertising has settled for itself the question of its right to exist. It has proven itself one of the most efficient and mobile factors in today's business."

NEWS OF THE INDUSTRY

Rubber Situation Constantly Improving

Although Production in General has not Reached Normal, Industrial Improvement is Being Regularly and Consistently Reported from Akron

Although production in general has not as yet reached normal, according to a digest of many reports received from Akron by THE RUBBER AGE, consistent improvement in the industrial rubber situation is being reported regularly. The second quarter of 1922 found the tire industry in a more healthy condition than it has enjoyed for some time past. Those companies which were able to weather the storm of depression successfully are going ahead calmly with faith in the prospective volume of sales for the second and third quarters, which, as far as the tire end of the industry is concerned, are the best in the year.

Many Companies Report Good Business

Practically every company manufacturing tires in Akron has reported increases in production, and, in many cases, sales. Many of the smaller companies continue to operate at capacity. One of the largest plants recently added 1,000 men in order to bring its daily output up to 24,000 tires a day. This company and two other large ones also reported that they were within 10 to 12,000 of their daily production capacity.

Mechanical Goods and Footwear

Sales in mechanical goods have shown substantial gains, a few of the larger companies report. Products such as rubber packing are in better demand, and large public service and transportation corporations are beginning to show their purchasing power. Garden hose, rubberized clothing, summer footwear, rubber bathing caps and suits are selling well for future delivery. The rubber bathing suits are a comparatively new product, having been placed on the market here in America only as recently as last winter. It is expected that these rubber bathing suits will take very well with the public. If sales in this novelty even approach last winter's sale in galoshes, the manufacturers will indeed enjoy a boom.

The Coal Strike

It is claimed by experts that the only reason for the low production of non-union fields as compared to union fields is to be found in the inability of the operators to find a market for their coal. In view of the high prices existing in some industrial centers, this statement must assuredly seem exaggerated or far fetched. Nevertheless, the present coal strike has had at this writing no great effect on industry outside of the coal fields. Both sides are still fencing and the end of the strike is not yet in sight.

P. L. Palmerton, Chief of Rubber Division, Sails for Europe

P. L. Palmerton, Chief of the Rubber Division of the Bureau of Foreign and Domestic Commerce, sailed from New York Saturday, April 29, on the "Centennial State" for London, England, where he will begin the first special rubber goods market investigation ever undertaken by the Government, wholly in behalf of the rubber industry.

This investigation is a part of Secretary Hoover's program in which the Bureau of Foreign and Domestic Commerce was reorganized along lines which were calculated to be of greater practical utility to the business community.

It is Mr. Palmerton's purpose to cover Great Britain first, after which he will investigate conditions in France, Holland, Belgium, Germany, Denmark, Norway, Sweden, the Northeastern, Central, and Southeastern countries of Europe, and, if time permits, touch countries of the Levant and Northern Africa, returning through Italy, Switzerland, and Spain. The investigation will probably require eight or ten months.

Not only does Europe afford a market for American-made rubber goods, but it also is the center of America's rubber goods competition, so that Mr. Palmerton's double purpose will be to investigate the possibilities for the sale of American-made rubber goods in Europe, and to attempt to secure some idea as to the ability of the European rubber industry to compete for the foreign rubber goods trade in all countries.

Talmon H. Rieder Dead

In the death of Talmon H. Rieder, president of Ames Holden McCready, Ltd., Montreal, the Canadian rubber industry has lost a beloved leader.

Mr. Rieder, who died April 15, began in 1900 as a bookkeeper and director of the Berlin Manufacturing Co., Ltd., Kitchener, Canada. The Merchants Rubber Co., Ltd., was organized by him in 1903 when he built the plant at Kitchener and became managing director. Four years later the Canadian Consolidated Rubber Co., Ltd., absorbed these companies and appointed Mr. Rieder vice-president and manager of the two companies at Kitchener.

The Canadian Consolidated Company elected him vice president in 1908; he also was appointed its general manager in 1915; and in 1917 he was elected president.

Talmon H. Rieder with others in 1917 incorporated the $3,000,000 Ames Holden Tire Company, Ltd. to manufacture tires and accessories, and a large plant was constructed at Kitchner. He also was an incorporator of the Mount Royal Rubber Co., Montreal, to manufacture tires and other rubber goods. Shortly afterward he was elected president of Ames Holden McCready, Ltd., manufacturers of rubber footwear.

Mr. Rieder was a member of many organizations, including the Engineers' Club, University Club of Montreal, the Rubber Association of Canada and The Rubber Association of America, Inc.

Fisk Stockholders Meet

Stockholders of the Fisk Rubber Company, Chicopee Falls, Mass., met at the offices of the company April 27. In addition to the usual routine business, all contracts, proceedings and appointments of the board of directors, executive committee and officers of the company since the last annual meeting were approved.

The following were elected directors for the ensuing year: Ralph H. Bollard of New York, Edward H. Broadwell of Springfield, Stedman Buttrick of Boston, William F. Cutler of New York, James Dean of Boston, Harry T. Dunn of New York, Harry G. Fisk of Springfield, Benjamin H. Pratt of Milwaukee, Richard S. Russell of Boston.

Firestone Branch Managers and Salesmen Convene

Salesmen and branch managers of the Firestone Tire & Rubber Co. to the number of about 600 from all parts of the country and representatives from various parts of the world were in attendance at the three-day convention which began April 24 at the offices of the company.

Addresses were given by Col. L. P. Ayres, vice president of the Cleveland Trust Company, and Bishop Frank Du Moulin, among others. Trips through the factories to inspect the many products of the company in the course of manufacture, the inspection of displays, and a trip to the Firestone home and farm were features of the program.

To Consolidate Two Plants of Boston Rubber Shoe Co.

According to a recent announcement, the two Massachusetts plants of the Boston Rubber Shoe Company, a subsidiary of the United States Rubber Company, will be consolidated. The plants are located at Fells and Edgeworth, but after May 22 all work will be done at the latter plant. It is stated that the change is made to reduce manufacturing costs and that the balance of the production this year will be greater on heavy goods and less on shoes than last year.

May Act On Crude Rubber Production

British and Dutch Governments May Confer on Joint Legislative Action to Restrict Crude Rubber Production in Far East

At the meeting of the council of the Rubber Growers' Association of London on April 3, Sir Stanley Bois, the chairman, made the following statement as to the deliberations of the British Colonial Office Committee appointed last fall to investigate the condition of the rubber-producing industries in the British Empire:

"The Committee were so concerned at the seriousness of the position of the plantation rubber that they promptly made up their minds in favor of Governmental action. The British Colonial authorities are known to be favorably disposed to take suitable legislative action to safeguard the industry, and, as stated in the House of Commons, discussions are still proceeding with the Netherlands East Indies Government as to whether and on what lines they are prepared to co-operate.

"There is strong ground for believing that the British Government authorities concerned would welcome a conference in London with the Dutch on the subject of the form which such legislative action should take."

In the House of Commons on April 4, says the *India Rubber Journal* of London, Major Boyd-Carpenter asked the Secretary of State for the Colonies, in view of the depressed state of the rubber industry and the great loss sustained by investors, amounting to £190,000,000 since 1920, whether some statement could be made as to the nature of the report of the Committee appointed by the Colonial Office and as to the position of the negotiations which were being carried on with the Government of the Dutch East Indies and as to the prospects of an early agreement.

Mr. Churchill: I am not in a position to make a statement at the present time, as discussion is still proceeding with the Government of the Dutch East Indies, nor can I hold out any prospects of an early agreement.

Personal

F. C. Rudisell has resigned as general manager of the Overland Tire & Rubber Co., of Omaha, Neb. He has not announced his plans.

* * *

George W. Ball, a resident of Bellaire, Ohio, was elected chairman of the board of directors of the Knox Tire & Rubber Co., Mt. Vernon, Ohio, at a recent meeting.

* * *

Edward C. Grueh', manager of the New York Belting & Packing Co., spoke before the Passaic (N. J.) Lions' Club, of which he is a member, April 11 on mechanical rubber goods. He presented several members with samples.

* * *

Walter Kemp of Heilbut, Symonds & Co., Ltd., crude rubber traders, of London, England, visited rubber centers in the United States during April in company with Frank Poel of Poel & Kelly, of New York, American representatives of the London house.

* * *

J. K. Williams, founder of the Williams Foundry & Machine Co., of Akron, from which he retired in 1918, has been elected vice president of the Franz Foundry & Machine Co. with offices in the Metropolitan Building in Akron and plant at Barberton. He was formerly associated with C. Franz, president of the Franz company.

* * *

Paul W. Litchfield, vice president and factory manager of the Goodyear Tire & Rubber Co. and Harry S. Quine of the General Tire & Rubber Co. were the principal speakers at a meeting of the East Akron Board of Trade on April 20. Mr. Litchfield reviewed the various phases of readjustment in Akron. Mr. Quine predicted a virtual point of saturation for the country in new motor vehicles in 1925.

* * *

D. L. Brown, foreign advertising manager for the Goodyear Tire & Rubber Co., Akron, has presented to Ohio Wesleyan University, from which he was graduated in 1908, a unique and valuable collection of antiques including four lamps representing as many periods of civilization and five tear vases unearthed at Carthage. The antiques were gathered in 1908 when Mr. Brown visited Carthage and the lost African city of Thamugadi.

Seiberling Rubber Company Cuts Price of Tires

One of the surprises of the past two weeks was the price reduction made by Seiberling Rubber Co., Akron, Ohio, on Portage fabric tires—a cut approximating 10 per cent straight through the Portage fabric line, effective April 24.

On the same date the company announced slight alterations in the Seiberling straight-side cords list prices—which bring net prices on this line into conformity with standard lists.

Mr. Seiberling in announcing the drastic reduction in Portage fabric tire prices just at the time when price advance rumors have been current in the trade, said that so far as the Seiberling Rubber Company is concerned, he could see no reason for an advance in prices at this time.

"The plant efficiencies have made possible this Portage fabric tire reduction," said Mr. Seiberling. "Our production per unit of equipment and per man, is being operated on a much more efficient basis than heretofore."

Seiberling factory methods have been installed in both the New Castle and Barberton plants, with the result that the company is now manufacturing a product of better quality at a far lower unit cost than the former managements had achieved.

Production is going ahead rapidly—as are sales. The two Seiberling plants are now making about 2000 tires and 2300 tubes daily—re-orders from dealers necessitating immediate large production increases.

Falor Manufacturing Co. May Move to Larger Plant

The newest of Akron's rubber companies, the Falor Manufacturing Co., reports that its business has increased to such an extent that it is compelled to look for a larger plant. Within the past few weeks it has doubled its output and put on a night shift. The Falor company, which is engaged in the exclusive manufacture of tubes, had a daily output of 1000 tubes before production was increased by the night shift.

Trade Removals

On May 1 A. W. Stedman, crude rubber broker, removed his office in New York from 68 Broad Street to 90 West Street.

* * *

Paul Bertuch, importer and exporter of rubber, who was at 25 Beaver Street has announced the removal of his office to 24 Stone Street, New York.

* * *

Charles T. Wilson Co., Inc., specializing in the importation of crude rubber, recently announced the removal of its offices from 53 Wall Street to 82 Beaver Street, New York.

* * *

Another importer of crude rubber, specializing in the crude, washed and refined grades, H. A. Astlett & Co., has announced its removal to 64 Water Street, New York, from 113 Pearl Street.

* * *

William H. Cummings & Sons, established in 1873 and engaged in crude rubber brokerage, on May 1 removed to larger offices at 30 Church Street, New York. The firm was formerly located at 60-62 Harrison Street.

* * *

The Eastern Rubber Company, Trenton, N. J., has removed its store from 103-5 Factory Street to 123 Factory Street. The new store, which was completely remodeled, opened for business April 15.

J. E. Harris Joins Ardmore-Akron Tire & Rubber Co.

J. E. Harris, experienced for many years in the rubber business and in the sale of tires, has joined the Ardmore-Akron Tire & Rubber Co., Ardmore, Okla., as vice president in charge of sales. Both Mr. Harris and W. B. Pifer, who is to be his assistant, are well-known in the

J. E. Harris

industry, especially in the Mississippi Valley. The new vice president comes from Kansas City, Mo.

O'Sullivan Rubber Co. Wins Heel Appeal

The O'Sullivan Rubber Co., Inc., New York, April 12 won an appeal from the decision of the District Court in the United States Circuit Court of Appeals in its suit asking an injunction restraining the Genuine Rubber Co., Saugus, Mass., from putting on the market a suction rubber heel and employing in connection therewith certain structures as to features, letters and arrangements.

The Circuit Court ruled as follows:

"We therefore think there can be no doubt but that the words as used on the O'Sullivan heel have come to mean to the mind of the purchasing public that the heel bearing them is manufactured by O'Sullivan."

The court concluded: "We think the only reasonable conclusion is that the words used on the Genuine heel present such a similarity to the ordinary purchaser that the Genuine heel is the O'Sullivan. We are also of the opinion that the reduced price at which cobblers can procure the Genuine heel is an inducement to the cobbler to produce them to palm off on the public as goods of O'Sullivan."

Finally the court said: "The decree of the District Court is reversed and the cause remanded to that court for further proceedings not inconsistent with this opinion, with costs to the appellant."

Rubber Growers' Association Reports 905 Members

The report of the council of the Rubber Growers' Association, of London, for 1921 shows a membership of 905 or 548 companies and 357 individuals. Of the companies, 531 represent a capital of £77,740,818 and own an acreage of 2,644,301.

The output control committee did much to help in the voluntary restriction of crude rubber production, the report points out. Although the market price of crude rubber averaged less than cost of production except where companies were fortunate enough to have contracts for future output there can be no doubt but that the industry would have been substantially worse off were it not for the work of this committee.

The Rubber Growers' Association is still engaged in the investigation of new uses for rubber but in respect to existing uses, a definite program has been mapped out whereby manufacturers and distributors will cooperate. A series of booklets dealing with rubber and its manifold uses will be a feature of this campaign.

Atlanta Manufacturers Start Drive to Sell their Products

Three Atlanta, Georgia, rubber manufacturers, namely, the Doss Rubber & Tube Co., the Diamond Holdfast Rubber Co., and the Victory Rubber Manufacturing Co., got together during the latter part of April and launched an extensive advertising campaign. The manufacturers jointly agreed to set apart April 21 as a "Buy Atlanta Rubber Products" day. On that day every jobber and retailer offered special inducements to the consumer.

Among the rubber commodities manufactured in Atlanta are tires, tubes, repair stock, plumbing supplies, mats and aisle runners, fan belts, friction and rubber tape, rubber cements.

Vulcanized Rubber Company Enjoying Good Business

A good volume of business is reported by the Vulcanized Rubber Co., 251 Fourth Ave., New York, manufacturers of hard rubber products. In some departments it is said there are enough orders to keep them busy for several months. The plant, where 400 hands are employed, is now as busy as it was during the war period when parts of gas masks were made in great numbers.

It is said that radio equipment is largely responsible for the present boom as the Vulcanized company is well-stocked with orders for radio-equipment parts. In addition the company makes articles such as combs and pipe stems. The output of pipe stems for March was unusually large.

Litchfield Speaks on Future of Tire Industry

"Business is on the way upward. The rubber business was one of the first to suffer and is now the first to recover. Tire manufacturing which is 'approximately 75 per cent of the rubber business is on a sound fundamental basis," declared P. W. Litchfield, vice president and factory manager of the Goodyear

Paul W. Litchfield

Tire & Rubber Co., in an address delivered April 25 on "What's Ahead in the Rubber Business" before the East Akron Board of Trade.

"In the spring of 1920 the monthly wage average at Goodyear was 250 per cent of the 1914 wage, with the cost of living 215 per cent of the 1914 cost of living. Today the purchasing power of the average employe is approximately 30 per cent greater than in 1914, and approximately 20 per cent greater than in any year since 1914 except 1921. These facts spell sound prosperity for prospective business in general.

"We have merely scratched the surface of the tire business for large passenger busses and freight transportation trucks. Even during the recent depression, the increase in the use of big busses has been really surprising. Fully 85 per cent of the tires used in this method of transportation are made in the Akron district.

"As I see the city of the future, the very near future, it is going to be a city of smooth paved streets, without rails or wires. Transportation can be furnished more quickly as cities expand. Just as soon as business is there, the new form of transportation is going to be there too. Modern cities will be quick to take advantage of that new and better, as well as cheaper form of transportation.

"A year ago was a time for extreme cooperation, and that is equally true today, but the rewards of optimism and courage are already apparent. The rubber industry is going ahead on these lines, and other business must follow in the same direction."

The April Meeting of the Mid-West Association

The regular monthly meeting and luncheon of the Mid-West Rubber Manufacturers' Association held at the Hotel Morrison, Chicago, on Tuesday, April 11, brought together close to fifty members of the rubber trade from various parts of the country. The meeting was presided over by President W. W. Wuchter, general manager of the Nebraska Tire & Rubber Co.

Manufacturers attending the meeting reported a slow but steady improvement in the demand for tires.

Several of the firms report they are operating 24 hours a day; a few stated they were gradually advancing prices and that jobbers are coming into the market for considerable quantities of tires.

One manufacturer deplored the tendency of a number of the factors of dumping large quantities of cheap tires in the South, and he incidentally stated that business generally in the South had shown a decided improvement in the past six weeks.

Difficulty in collections was discussed by several makers and others emphasized that their cash method was obviating this trouble.

At the meeting following the luncheon the principal speaker Arnold Joerns, of the Joerns Advertising Co., Chicago expressed the belief that the present situation has a considerable improvement over a year ago and that conditions may reasonably be expected to continue to improve.

The May meeting of the Association held Tuesday, May 9, will be reported in an early issue.

Republic Rubber Operating at Profit

For first time in several years Republic Rubber Corporation, Youngstown, Ohio is on a profitable operating basis. Net operating profit in March was $27,000 after interest and all other charges. Shipments to the middle of April were 10 per cent greater than during corresponding period in March.

Rubber Companies Adopt Metric System for Purchasing

In an article entitled "Progress in Metric Standardization" published in the April issue of the *Journal of Industrial and Engineering Chemistry*, it was pointed out that the following rubber companies and those chemical companies selling to rubber manufacturers had adopted the metric system of weights and measures:

American Hard Rubber Company, American Rubber & Tire Co., Batavia Rubber Company, B. F. Goodrich Company, Dayton Rubber Mfg. Co., Firestone-Apsley Rubber Co., Fisk Rubber Company (laboratory supplies only), Howe Rubber Corporation, Kokomo Rubber Company, Naugatuck Chemical Company, Spreckels "Savage" Tire Co., Swinehart Tire & Rubber Co., Thermoid Rubber Company.

Hereafter, the above firms will purchase chemical and chemical supplies in metric units as far as feasible.

Tom Wilkinson to Represent Lee Tire & Rubber on Pacific Coast

A recent acquisition to the executive force of the Lee Tire and Rubber Co. is Tom H. Wilkinson as Pacific Coast representative.

Mr. Wilkinson's resignation as manager of the San Francisco branch of the U. S. Rubber Co. a few weeks ago came as a surprise after seventeen years of service with that corporation. Considerable conjecture as to Mr. Wilkinson's future plans resulted as he left San Francisco for the east without an announcement of any kind as to his future affiliations.

TOM H. WILKINSON

Many years ago Tom Wilkinson was an associate of Harry E. Field, now General Sales Manager of the Lee Tire and Rubber Co. in the old Hartford Rubber Works Co. and in fact came to San Francisco originally as representative of that company. When the Hartford Rubber Co. was absorbed by the U. S. Rubber Co., Wilkinson joined the new organization and has held important executive positions in the U. S. Rubber Co. ever since.

During his recent visit to the Pacific Coast, in the interest of the Lee Co., Mr. Field called on his old associate Tom Wilkinson to find that he had just handed in his resignation to Col Brady of the U. S. Rubber Co.

Mr. Wilkinson's appointment with the Lee Co. was the result.

Receivers for Gillette Rubber

C. W. Lockwood and Frank C. Herman were named receivers for the Gillette Rubber Co., Eau Claire, Wis., by Judge Luse in district court April 14 in a suit brought against the Gillette company by J. Frank Pflug. Orders were entered to require creditors to file claims with the clerk of court before June 1.

The Annual Report of the Ajax Rubber Company

After deducting all expenses, making provisions for depreciation, writing down cost of tire fabrics and crude rubber used during the year in excess of amounts charged to manufacturing costs, the Ajax Rubber Co., New York, reported a total loss of $5,205,577 for the year ending Dec. 31, 1921, against $1,333,368 in 1920.

Details of the income account for 1921 and 1920 follow:

Loss for year	$1,616,295	$233,368
Dividends paid	—	1,100,000
	1921	1920
Deficit	$1,626,295	$1,333,368
Cost fabric and crude rubber in excess of amounts charged manufacturing costs, &c	3,127,179	—
Int. on borrowed money	452,103	—
Total deductions	$3,579,282	—
Total deficit	$5,205,577	$1,333,368
Previous surplus	1,615,481	2,128,849
Deficit	$3,590,096	*$795,481
Surplus arising from appraisals of properties	272,359	—
Deficit	$3,317,737	*$795,481
Prem. on cap. stk. sold	—	820,000
Final deficit	$3,317,737	*$1,615,481

*Surplus.

Horace De Lisser, chairman of the board, said in his remarks to the stockholders: "The business of the company is now upon such a plane that the predictions of your management heretofore made as to the prospects for the year 1922 may be looked upon as reasonably likely of fulfilment, as rather substantial earnings have already resulted from business operations during the first quarter of the present year.

"All of the high priced materials included in the company's inventories have been worked off and at present tires are being manufactured from raw materials at a cost equivalent to or substantially under the present market prices therefor. Our affiliations with automobile manufacturers have been extended and we are presently engaged in supplying a substantial proportion of the original equipment on standard makes of cars, which business, besides producing a satisfactory profit, is spreading the merits of our product among consumers to a greater degree than heretofore."

Brubaker Elects Officers

Incorporators of the new Brubaker Tire & Rubber Co., Akron, Ohio, met April 13 to elect directors and officers. Those chosen were: William A. Brubaker, president; G. A. Elfers, vice president; I. M. Elfers, secretary and treasurer; and C. A. Rukamp, assistant secretary. These four officers were also elected directors of the company which plans to manufacture a cushion tire.

Rubber Jobbers Incorporate

M. N. Nobil and D. M. Siff, doing business at Akron, Ohio, as the Summitt Rubber Company recently incorporated their company. Authorized capital is fixed at $125,000.

W. O. Rutherford Visits Goodrich Interests in West and South

W. O Rutherford, vice president in charge of sales for the B. F. Goodrich Co., has just recently returned from an extended trip to the Pacific Coast and the South. He visited every Goodrich branch on the coast, and held conferences with all the western and southern salesmen.

Speaking of conditions as he found them, Mr. Rutherford said:

"After viewing conditions throughout the Western States and the South, I am convinced that this industry is in a sound position, generally, and ready to keep pace with the improving conditions of the year.

"Here and there liquidation of stocks has not yet been completed but this is true only in certain sections. On the whole we can face the spring and summer with confidence in the strong position of our industry.

"A spirit of optimism is very evident throughout the West and South, especially in the farming regions where I found better prices for farm products reviving the spirit of the farmer and creating a more favorable sales condition.

"If we can take advantage of these improvements without over-stepping ourselves, if the industry can expand with the expansion of the market, and no faster, I believe 1922 will be a very successful year for all of us. To do this requires a careful and constant study of conditions in all parts of the country. My western trip convinced me that a sane and economic policy of advancement based on the national laws that govern good business will bring us the stability, progress and prosperity we have been looking for these many months. I am certain the sun of prosperity is shining for the whole industry."

Mr. Rutherford's wide knowledge of the rubber business places him in an excellent position to judge what the future months will bring.

U. S. Rubber Increases Operations in Footwear

The Woonsocket Rubber Company, which is owned by the United States Rubber Co., New York, and operates plants at Woonsocket and Millville, R. I. started its active manufacturing season in the footwear division about May 1. So far this year the volume of business done by the United States Rubber Company has been showing a healthy improvement. Sales of mechanical goods have shown a gradual but steady increase each month since January.

Wooster Plant of Kelly-Springfield Tire Co. Sold

The Pneumatic Disc Wheel Company, Richmond, Va. has purchased the Wooster plant of the Kelly-Springfield Tire Company and will take possession soon. The purchase price was $150,000 which includes the building, machinery, several acres of ground and a siding. The Wooster plant had been closed due to the centralization of the plants of the Kelly-Springfield Company at Cumberland, Md.

C. A. Swinehart Now Sales Manager for Hannibal Rubber Co.

C. A. Swinehart, who was recently associated with the Victor Rubber Co., Springfield, Ohio, as sales manager, has accepted a position in the same capacity with the Hannibal Rubber Co., Hannibal, Mo., manufacturers of Mark Twain tires and tubes.

Mr. Swinehart has had an experience of fifteen years in the rubber industry, eight of which he spent with the Victor company. For seven years he was sales manager for the Swinehart Tire & Rubber Co., Akron, Ohio.

Canton Foundry & Machine Co. Move New York Office

The Canton Foundry & Machine Co., Canton, Ohio, the manufacturers of Canton Alligator Shears, cranes and turntables, have moved their New York office from the Grand Central Palace to 203 East 15th Street, where it will be maintained under the personal supervision of H. B. Bergere and L. Wechsler.

The Canton Foundry & Machine Co. have been in business over fifty years and in that time have not only enjoyed a good domestic business but have built up an export trade.

During this time many rubber manufacturers and reclaimers have bought Canton Alligator Shears, using them with utility and satisfaction. The New York office is maintained to handle all business matters covering the entire eastern states and the export trade.

The Administration of the Republic Rubber Corporation, Youngstown, Ohio

OFFICERS AND DISTRICT MANAGERS WHO ATTENDED THE SALES CONFERENCE HELD AT THE YOUNGSTOWN PLANT DURING THE FIRST WEEK IN APRIL

Front Row, left to right; A. B. FILSON; D. R. WOODCOCK, district manager at Minneapolis; H. J. STAMBAUGH, treasurer, at Youngstown; H. J. WOODARD, manager Republic tire sales, Youngstown; E. H. FITCH, manager, Youngstown; C. H. BOOTH, receiver; L. A. WATTS, purchasing agent; J. H. CONNORS, manager mechanical goods sales, Youngstown; C. H. ZIEME, assistant to acting works manager, Youngstown, and J. C. KEARNS, mechanical goods sales department, Youngstown.

Back Row, left to right: M. L. FRAZIER, sales department, Youngstown; E. B. TOZIER, district manager at Chicago; E. A. LIGHTNER, district manager New York; N. J. MURRAY, manager, Canton-Blackstone Co., New York; H. A. ROGERS, district manager, Cincinnati; D. E. TYLER, district manager, Atlanta; H. L. WILSON, sales manager Canton-Blackstone Co., Youngstown; W. B. OHL ,auditor; W. D. SKINNER, credit manager; W. D. ARMOUR, district manager, Kansas City; EDGAR EVANS, sales department, Youngstown; R. E. OLIPHANT, mechanical department, Chicago.

Goodrich Stockholders Re-Elect Directors and Officers

At the annual meeting of the stockholders of The B. F. Goodrich Co, Akron, Ohio, held April 19, L. D. Brown, W. C. Geer, C. C. Goodrich, F. H. Mason, W. A. Means and A. H. Noah were re-elected directors for the full term of three years.

At the directors' meeting which followed all officers were re-elected.

The volume of sales for the first quarter of this year shows an improvement compared with the same period of 1921 not only as to tonnage and units, but also in dollars.

The directors declared the regular quarterly dividend of $1.75 per share on the preferred stock, payable July 1, 1922, to stockholders of record June 21, 1922.

Stanwood Rubber Co. Organized

The Stanwood Rubber Co. is the name of a new company which has been organized to take over the plant of the former Stanwood Rubber Co, Elizabeth, N. J., which went into the hands of receivers sometime ago. The affairs of the old company have been wound up.

The officers of the new company are as follows: President, S. P. Woodard; vice president and general counsel, Manning Stires; treasurer, C. K. Cooper; secretary, E. M. Barradale; assistant secretary and assistant treasurer, C. O. Corey; trustees, S. P. Woodard, Manning Stires, C. K. Cooper, E. M. Barradale, Edward Hutchens, Eau Claire, Wis., and D. Webb Granberry of East Orange, N. J.

It is announced that they will engage in the manufacture of mechanical rubber goods in addition to tires, and production has started already at the Elizabeth plant.

This company has also acquired the Hubbell Tire & Rubber Co. which is operating a small tire plant at Newton Falls, Ohio. This will be run as a subsidiary of the Stanwood Rubber Co., and will be known as the Hubbell Rubber Co.

General offices have been established at 1819 Broadway, New York.

Brubaker Tire & Rubber Incorporated at Akron

William A. Brubaker, superintendent and mechanical engineer of the Akron Gear & Engineering Co., and Gustave A. Elfers have incorporated the Brubaker Tire & Rubber Co. with an authorized capital stock of $400,000 at Akron. The new company will manufacture tires and other rubber goods.

Arthur T. Hopkins Now Treasurer of Engineering Firm

Arthur T. Hopkins has recently become a partner and treasurer of the engineering firm of H. M. Haven and Wm. W. Crosby, Inc., 40 Court St., Boston, Mass.

This corporation is well known in the industrial field. Its specialty has been refrigeration, confectionery and other manufactures calling for controlled atmosphere. It will now maintain a department of industrial engineering and management. This opens up a very broad field and is in response to a demand from financial and industrial interests for a constructive analysis of industrial problems.

This department will deal primarily with the following features:

1. Purchasing, including raw material stores, and laboratory control.
2. Production, including routing, transportation and labor rates.
3. Manufacturing economies, including equipment, combustion, steam, material, labor and methods.

ARTHUR T. HOPKINS

4. Personnel, including selection, training, organization and industrial relations.
5. Merchandising, including stocks, sales policy and manufacturing policy.
6. Finance, including accounting, costs and credits.

Mr. Hopkins is unusually well qualified by experience and ability to solve problems of industrial management.

He is well known in the rubber world. Born in 1869, he spent some years in general business before graduating from the Massachusetts Institute of Technology.

From 1900 to 1912, he was assistant superintendent and superintendent of the Boston Woven Hose and Rubber Co., during which time he re-organized the entire factory, department by department, and built the new plant.

In 1912 he was manager of the Cleveland mechanical plant of the United States Rubber Co., and spent the next five years in reorganizing and rebuilding this plant.

In 1917 he was transferred to the footwear division of the United States Rubber Co. as Industrial Engineer and spent the next five years in reorganization and management work among the footwear and miscellaneous factories of that system.

New American Chalk Deposit To Be Developed

The trade will be interested to know that a large deposit of genuine chalk cliffstone waiting has been located at White Cliffs, Ark. The property comprises over twenty-nine hundred acres. The Krippendorf-Tuttle White Cliffs Products Co. has been organized, the property has been purchased and the machinery and equipment are already being installed. No money has been spared in equipping this plant for most efficient production. The men behind the project are very successful business men and the success of the company is assured and placed on a permanent basis.

A. Daigger & Co., 54 W. Kinzie St., Chicago, importers of colors, chemicals and oils have been appointed sole agents and distributors for the product which will be called "K-T" Cliffstone Chalk. Inquiries are already being received from all parts of the country as the product has been passed upon by manufacturers as being equal to the imported grades of chalk.

Calvin Stitt, manager for the Daigger company recently left Chicago to visit the deposit where every effort is being made to start production at the earliest possible moment. The plant is being built to handle an output of from 200 to 300 tons per day.

Longwear Rubber Co. Plant Sold

The plant of the Longwear Rubber Company at Elyria, Ohio, has been sold to the Highway Construction Co. and will no longer be used for rubber manufacture, according to an announcement made by Sam Horvitz of the construction company. Although Mr. Horvitz declined to state the purchase price, it will be remembered that the Longwear Rubber Company paid about $200,000 for the plant some years ago.

Tuscora Plant to Resume

C. C. Adams and H. J. Krantz, receivers for the Tuscora Rubber Co., New Philadelphia, Ohio, applied to the court on April 11 for permission to operate the plant continuously until further orders or as long as operation can be maintained at a profit of ten per cent above production costs.

The application was sanctioned by the new board of directors consisting of: N. W. Senhauser, C. E. Kreiter, C. J. Pfau, Joe Hrbak, T. B. Stroup, W. G. Immel and Alvin March. N. W. Senhauser, president, and C. E. Kreiter, secretary and treasurer signed the application. C. J. Pfau is vice president of the company.

Following the order of the court, the receivers are preparing to resume production. Under a plan of selling to stockholders at wholesale list prices it is planned to begin on a basis of 150 tires a day. Tires will also be sold through general trade channels. It is expected that from 75 to 100 men will be employed.

U. S. Rubber Co. Holds Annual Meeting and Election

The annual meeting of the stockholders of the United States Rubber Co. was held in New York on April 18. Newcomb Carlton, president of the Western Union Telegraph Co., was added to the directorate. Directors who were re-elected are: James S. Alexander, Walter S. Ballou, Nicholas F. Brady, Middleton S. Burrill, John W. Davis, Sir Mortimer B. Davis, James Deshler, James B. Ford, James Newton Gunn, Francis L. Hine, Ernest Hopkinson, Henry L. Hotchkiss, Lester Leland, Samuel M. Nicholson, Raymond B. Price, Homer E. Sawyer, Charles B. Seger, William H. Truesdale, Frank A. Vanderlip.

George S. Shugart, vice president and general sales manager of the United States Tire Co., was elected a second vice president of the United States Rubber Co.

The administration of the United States company now stands as follows:

Executive Committee

Charles B. Seger — Walter S. Ballou
Lester Leland — Nicholas F. Brady
James B. Ford — James S. Alexander

Officers

Charles B. Seger, *Chairman of the Board and President*
Lester Leland, *Vice-Chairman*
James B. Ford, *Vice-President*

Footwear, Mechanical Goods and Miscellaneous
Homer E. Sawyer
Vice-President in General Charge

Edward J. Coughlin
Second Vice-President in Charge of Manufacturing

George H. Mayo
Second Vice-President in Charge of Sales

Development and Patent Departments
Ernest Hopkinson
Vice-President in General Charge

Legal Department
Edward H. Hart*
Vice-President in General Charge

Overseas Activities
H. Stuart Hotchkiss*
Vice-President in General Charge

Samuel Norris
Secretary

John D. Carberry
Asst. Secretary and Asst. Treasurer

Treasury and Accounting
W. G. Parsons
Vice-President in General Charge

William O. Cutter, *Comptroller* — Wilson H. Blackwell, *Treasurer*

Henry B. Hubbard
Financial Manager of Sales

Purchasing, Stores and Transportation
Raymond S. Willis
Second Vice-President in General Charge

Tires and Accessories
J. Newton Gunn
Vice-President in General Charge

Charles J. Butler
Second Vice-President in Charge of Manufacturing

George S. Shugart
Second Vice President†
Vice-President U. S. Tire Co. in Charge of Sales

General Counsel
John W. Davis

Auditors
Haskins & Sells

* Elected March 2, 1922
† Elected April 18

Number of Stockholders January 16, 1922

Preferred Stockholders	18,726
Common Stockholders	15,621
Total	34,347

Charles B. Seger, chairman of the company, said:

"The company's business generally has shown steady improvement since the close of last year, with the result that sales for the first quarter of 1922 are considered satisfactory.

"The tire business has shown a substantial gain in unit sales over the corresponding period of last year, and an increase in dollar volume of sales notwithstanding the lower level of prices compared with last year.

"Trade conditions among tire dealers point to a substantial increase in demand over last year.

The high quality of the company's products is reflected in increased demand, especially for Royal cord tires and tubes.

"There has been a steady increase in orders for mechanical rubber goods which is particularly indicative of improvement in general business conditions, especially as current orders are largely for immediate delivery.

"Footwear orders indicate that there are no abnormal stocks in the hands of dealers and while there has been conservatism in placing of orders for fall delivery, we look for normal business as the season progresses."

The official pamphlet report of the company issued April 9 showed net sales of $164,706,621 in 1921 against $256,150,130 in 1920. Net profits for the year after charging off $10,000,000 for inventory depreciation were $492,811. After the payment of dividends there was a deficit of $6,591,896 against a surplus of $4,015,217 in 1920.

Keystone Tire & Rubber Co. Reports Loss for 1921

The 1921 report of the Keystone Tire & Rubber Co., New York, recently issued, shows a net loss of $678,039 after expenses, interest and taxes, as contrasted with a net loss of $317,705 in 1920.

The company increased in 1921 its cash position $9,856 to $114,888, according to the balance sheet. Notes and accounts receivable dropped $1,084,430 to $1,353,473 and inventories from $492,651 to $368,265. Notes payable were reduced $153,597 to $295,000; current loans $95,000 to $125,000, and accounts payable $133,448 to $121,644. The company also paid off $423,056 of bank loans.

Dayton Rubber Mfg. Co. Now Working on Five-Day Basis

Although Henry Ford is credited with putting the five-day week into operation, the Dayton Rubber Manufacturing Company, Dayton, Ohio, had instituted a similiar plan before Ford's was introduced. Since February 24 the Dayton company has been operating on a five-day-week basis. The new system is said to be economical and productive of results.

The decision to inaugurate the five-day plan was made when plant executives found that production on Saturday morning was not equal to that of other half days.

"The schedule has produced as many tires and tubes as during the five and one-half day week," John A. MacMillan, president announced on April 6: "Our employes are making just as much money as under the former system and the company is saving in overhead expense."

A bulletin announcing the change said in part:

"We have checked our production on Saturday mornings and find as a rule it runs about one-fourth what it does on a normal day.

"This is due to the fact that the men think Saturday is a sort of holiday and they lay down on the job. We have noticed girls coming in on Saturday morning dressed as if they were going to a party. As a consequence production has decreased on Saturday."

Trumbull Tire & Rubber Co. Plant Sold

The plant of the Trumbull Tire & Rubber Co., Newton Falls, Ohio, on which the Hubbell Tire & Rubber Co., Cleveland, has a lease which will expire November 1, 1922, was sold to the Union Savings & Trust Co., Warren, Ohio, April 13. It is understood that the trust company acted for a client. The consideration was $130,000.

The sale was the result of a law suit filed in common pleas court of Trumbull county in 1920 by the Stambaugh Company, Youngstown, against the Trumbull company for payment on the construction of the plant. The plaintiff asked for the appointment of a receiver.

The Hubbell Tire & Rubber Co. bid $115,000 for the plant.

Rufenacht Rubber Co. Reports First Year Was Good One

According to P. M. Heater, general manager of the Rufenacht Rubber Co., Bucyrus, Ohio, which celebrated its first anniversary on April 7, the company enjoyed good business during its initial year. The company turned out 50,000 30 x 3½ "Roughneck" tires (a play on the name of the company). Only this one size is manufactured at the plant where 65 men are steadily employed.

Robert Butler, who was formerly connected with the Portage company, is plant superintendent.

MARKETS

Cottons and Fabrics

NEW YORK, MAY 3, 1922

Cotton quotations for almost the entire two weeks period kept within a narrow range and the conclusion might have been drawn that prices had about reached the point of stability. And then on the first business day in May the market suddenly advanced $2.50 a bale and the next day on the wildest trading in years advanced $5.00 a bale. This unexpected action in prices was due partly to disquieting reports from the cotton belt, but more particularly to Government statistics of the consumption of cotton, showing that reports of curtailment of mill production had been greatly exaggerated. It should be remembered when considering the many New England mills that are idle that the mills in other sections are now doing a normal business; the southern mills particularly being very active. During November last year which was the best month of 1921 the total consumption of cotton was 526,610 bales. And yet with all the strikes and shut-downs in New England the consumption in March this year was 518,450 bales; which can favorably be considered with the average of 535,000 bales during that season of great prosperity, 1919-20. Statistics on spindle hours during March confirm those on consumption, there being only a slight falling off from the high point of last year.

A survey of the world cotton situation by the Department of Commerce indicates that 21,000,000 bales of cotton will be consumed during the year ending July 31, 1922; an estimated consumption of about 6,000,000 bales more than was produced for the crop year. Cotton consumption which reached the high point of 22,000,000 bales in 1913-14 has shown a steady decline to 18,000,000 bales in 1917-18 and to 17,000,000 bales in 1920-21.

During the past eight months cotton consumption has shown a strong upturn, reaching 14,400,000 bales with a prospective consumption, as stated, of 21,000,000 bales by the end of the cotton year. This would leave a carry-over of less than 8,000,000 bales; thus bringing cotton consumption and carry-over back to a pre-war normal basis.

The important developments to watch for the next few months, will be the rate of consumption, to see whether the world has actually returned to a 21,000,000 bale consumption, and prospective production. The world crop has only averaged 18,000,000 bales for the last five years; the highest in this period being 20,000,000 bales in 1920. Unfavorable weather and the boll-weevil have been the principal factors in the low crop.

Quotations as of May 2 on the New York Cotton Exchange follow:

	Open.	High.	Low.	Close	Prev. Day.
May	18.80	19.70	18.78	19.60@19.70	18.69
July	18.16	18.93	18.16	18.87@18.90	18.09
Oct.	18.40	19.05	18.35	19.00@19.04	18.28
Dec.	18.45	19.07	18.45	19.03@19.05	18.32
Jan.	18.39	18.95	18.37	18.86@18.87	18.23
Mar.	18.44	19.04	18.44	18.98@18.99	18.33

EGYPTIAN COTTON

The market for Egyptians has been quiet without much change in prices. Futures advanced about a cent during the last week of April as the result of purchases made by the Egyptian government to stabilize prices and the effect of this official buying to bolster a sagging market is being watched with interest. It was noted that after these first government purchases ceased much of the gain made was immediately lost. The demand centered principally on the low and medium grades of Saks while the better qualities and Uppers attracted but little interest.

There will be a larger acreage planted this season and while the lack of water may affect the quality a good sized crop is expected. The following prices were quoted for May shipment; Medium Saks, 32 cents; Medium Uppers, 25⅜ cents.

EXTRA STAPLE COTTON

High grade staples are in good demand and hard to get. Strict middling brought 1½ to 3 cents more than middling. Prices based on quotations from the south are as follows: inch and one eighths, 26 to 27 cents; inch and three-sixteenths, 29 to 30½ cents; inch and a quarter, 32 to 33 cents; inch and five-sixteenths, 34 to 35 cents. Pima cotton has been more active. Latest quotations are No. 1, 25 cents; No. 2. 33 cents; No. 3, 31 cents.

Southern Mills to Sell Direct

J. H. Lane & Co., Inc., the nationally known tire fabric house, with offices in New York, Chicago and Boston have perfected arrangements whereby a corporation to be known as Callaway Mills, Inc., will take over the selling agency and conduct the business of the Callaway Mills at La Grange, Ga. These mills which were so ably managed by J. H. Lane & Co. for twenty years manufacture specialities in fabrics for the automobile and rubber trade.

J. H. Lane & Co., Inc., will continue to represent the West Boylston Mfg. Co., of Easthampton, Mass., one of the oldest and largest producers of tire fabrics in the country, and also the Crown Cotton Mills of Dalton, Ga. Callaway Mills, Inc., will begin business July 1 and represent the Unity Cotton Mills, Unity Spinning Mills, Elm City Cotton Mills, Hillside Cotton Mills and Manchester Cotton Mills all of Georgia.

TIRE FABRICS

The prices for tire fabrics in general are decidedly firm as the result of increased inquiry. The following quotations give a fair idea of prices heard in the trade:

SQUARE WOVEN				
17¼-ounce Egyptian uppers, combed	lb.	.65	@	.68
17¼-ounce Egyptian uppers, carded	lb.	.60	@	.63
17¼-ounce Sakellarides, combed,	lb.	.75	@	.80
17¼-ounce Sakellarides, carded,	lb.	.70	@	.75
17¼-ounce Peeler, combed,	lb.	.55	@	.60
17¼-ounce Peeler, carded	lb.	.45	@	.50
CORD FABRICS				
Combed Sakellarides	lb.	.75	@	.80
Carded Sakellarides	lb.	.75	@	.80
Combed Peeler	lb.	.60	@	.65
Carded Peeler	lb.	.51	@	.55
Combed Egyptian uppers	lb.	.65	@	.70
Carded Egyptian uppers	lb.	.60	@	.65

Sheetings—The market was firm throughout the period but transactions were light. Manufacturers were inclined to hold prices higher in view of the sharp rise in cotton following the showing by the Government of cotton consumption.

Ducks—Inquiry for cotton ducks was much better, the call from the mechanical rubber trade being decidedly so. It is believed that the advance in cotton will do much to stimulate business. Single filling was quoted at 14 to 16½ cents; double filling, 16½ to 17½ cents; enameling duck, 32 to 39 cents.

Burlaps—The Burlap market continued very active at advancing prices. The impression prevails that the rapid advance in prices is in anticipation of a shortage; consumption being away beyond expectations.

SHEETINGS					
40-inch	2.50-yard	yd.	.12½	@	—
40-inch	2.85-yard	yd.	.11	@	—
40-inch	3.15-yard	yd.	.11¾	@	—
40-inch	3.60-yard	yd.	.09¾	@	—
40-inch	3.75-yard	yd.	.08¾	@	—
40-inch	4.25-yard	yd.	.07¾	@	—
DUCKS					
Belting		lb.	.30	@	—
Hose		lb.	.29	@	.33
Enameling		lb.	.32	@	.37
Shoe Ducks		lb.	.40	@	—
Single filling		lb.	.13½	@	.16
Double filling		lb.	.16	@	.17
BURLAPS (Carload Lots)					
7 -ounce	40-inch	yd.	5.35	@	—
7½-ounce	40-inch		5.40	@	—
7½-ounce	45-inch		6.40	@	—
10 -ounce	40-inch		7.40	@	—
10 -ounce	36-inch		7.55	@	—
8 -ounce	45-inch		6.50	@	—
10 -ounce	45-inch		8.25	@	—
10½-ounce	40-inch		7.50	@	—
DRILLS					
37-inch	3.25-yard	yd.	.09¾	@	—
37-inch	2.75-yard	yd.	.10½	@	—
37-inch	3.00-yard	yd.	.11	@	—
37-inch	3.50-yard	yd.	.09¾	@	—
37-inch	3.95-yard	yd.	.08¾	@	—
OSNABURGS					
30-inch	7-ounce		.09	@	.09¼
40-inch	7-ounce		.10½	@	—

Chemicals and Compounding Ingredients

THE GENERAL MARKET—NEW YORK, MAY 3, 1922—The industrial chemical market showed more activity during the last period as the demand from the rubber industry increased. The list in which we are particularly interested, with few exceptions, is in a very stable position. The dullness that prevailed during the early part of April failed to have any effect upon prices in the majority of cases and there is a feeling among producers that buyers will soon come into the market for their normal supply. Stocks in the hands of consumers are not large as for a long time the tendency has been to confine purchases to current requirements.

ACCELERATORS

Organic

Aldehyde ammonia, crystals	lb.	$ .90 @	.95
Aniline oil, bulk basis,	lb.	.16 @	.19
Excellerex,	lb.	.50 @	.60
Formaldehyde-Aniline	lb.	.45 @	.50
Hexamethylene-tetramine (powdered)	lb.	.72 @	.75
Paraphenylenetramine	lb.	1.60 @	1.70
Thiocarbanilide	lb.	.33 @	.50
Vulcocene	lb.	.35 @	—

Inorganic

Lead, dry red bbls.	lb.	.08 @	.08½
Lead, sublimed, white	lb.	.07 @	.07⅝
white, basic carbonate	lb.	.06½ @	.07¼
Litharge, domestic	lb.	.08½ @	—
imported	lb.	.17 @	—
Lime, Superfine	lb.	.02 @	.02½
Magnesium, calcined, light,	lb.	.24 @	.25
extra light	lb.	.45 @	—
heavy	lb.	.05½ @	.07½

COLORS

Blacks

Carbon Black	lb.	.13 @	.20
Micronex	lb.	.13½ @	.20
Lamp black	lb.	.17 @	.45
Bone "	lb.	.05½ @	.07½
Drop "	lb.	.07½ @	.16
Ivory "	lb.	.15 @	.45

Blues

Prussian	lb.	.50 @	.55
Ultramarine	lb.	.10 @	.35
Cobalt	lb.	.23 @	.25

Browns

Iron oxide	lb.	.05 @	.06
Sienna, Italian, raw and burnt	lb.	.06 @	.07
Umber, Turkey, raw and burnt	lb.	.05¾ @	.07½

Greens

Chrome, light, c. p.	lb.	.30 @	.32
medium	lb.	.35 @	.36
dark	lb.	.36 @	.45
commercial	lb.	.12 @	—
Rubber Makers Green	lb.	3.50 @	—

Reds

Antimony, crimson	lb.	.21 @	.24
golden	lb.	.20 @	.44
red sulphuret	lb.	.20 @	.22
Indian, English, pure	lb.	.12 @	.15
Para toner	100 lb.	1.40 @	—
Rubber makers red	lb.	3.50 @	—
purple	lb.	2.50 @	—
Toluidine tone	lb.	2.30 @	—
Tuscan red	lb.	.17½ @	.44
Venetian red	lb.	.02½ @	.06½
Vermillion, quicksilver, English	lb.	.85 @	.90
domestic	lb.	.25 @	.30

Whites

Albalith	lb.	.06 @	.06½
Aluminum bronze	lb.	.55 @	.60
Azolith	lb.	.06 @	.06½
Lithopone, domestic (factory)	lb.	.06¼ @	.06½
Zinc oxide. American Horse Head Special	lb.	.08 @	.08½
XX red	lb.	.07½ @	.08
American Azo: ZZZ (lead free)	lb.	.07½ @	.08
ZZ (under 5 per cent leaded)	lb.	.07¼ @	.07¾
Z (8-10 per cent leaded)		.07 @	.07½
Zinc oxide, French process, White seal	lb.	.11 @	.11¼
Green seal	lb.	.09¾ @	.10¼
Red seal	lb.	.08¾ @	.09¼

Yellows

Cadmium sulphide	lb.	1.50 @	1.75
Chrome, light, c. p.	lb.	.16½ @	.17
dark	lb.	.16½ @	.17
medium	lb.	.16½ @	.17
Ocher, French	lb.	.03 @	.04½
domestic	lb.	.02 @	.03
Rubber Makers' Yellow,	lb.	3.50 @	—

COMPOUNDING INGREDIENTS

Aluminum flake	ton	25.00 @	29.50
hydrate	ton	20.00 @	22.00
Ammonium carbonate,	lb.	.10 @	.12
Barium carbonate	ton	65.00 @	70.00
Barytes, southern off-color,	ton	.15 @	.17
Western, prime white,	ton	23.00 @	—
Basofor	lb.	.04½ @	—
Blanc fixe, dry, f.o.b. works	lb.	.04½ @	—
Chalk, precipitated, extra light	lb.	.03½ @	.04½
heavy	lb.	.02½ @	.03¼
Clay, China, domestic,	ton	7.50 @	9.00
imported	ton	22.00 @	23.00
Dixie	ton	22.00 @	32.00
Blue Ridge	ton	22.00 @	32.00
Fuller's Earth, powdered	ton	22.00 @	25.00
Fossil flour	ton	60.00 @	—
Glues, extra white	lb.	.30 @	.40
medium white	lb.	.20 @	.26
cabinet	lb.	.18 @	.30
cabinet low grade	lb.	.15 @	.18
common bone	lb.	.08½ @	.14
Graphite flake, bbls.	lb.	.06½ @	.12
powdered	lb.	.04 @	.10
Infusorial earth, powdered	ton	60.00 @	—
bolted	ton	65.00 @	—
Mica, powdered	lb.	.10 @	—
Rotton Stone (powdered)	lb.	.02½ @	.04½
Silica (aluminum)	ton	22.00 @	23.00
Soapstone, powdered	ton	12.00 @	—
Starch, powdered corn	cwt.	2.32 @	2.42
Talc, domestic	ton	18.00 @	20.00
French	ton	22.50 @	30.00
French, high grade	ton	40.00 @	45.00
Italian,	ton	44.00 @	55.00
Terra Alba, American No. 1	cwt.	1.85 @	2.00
American No. 2	cwt.	1.25 @	—
Tripoli	lb.	.02½ @	—
Whiting, commercial	cwt.	1.00 @	1.25
Quaker	ton	13.00 @	15.00
English cliffstone	cwt.	1.75 @	2.00
glider's bolted	cwt.	1.35 @	1.45
Paris white American	cwt.	1.30 @	1.40
Zinc Oxide— 5 per cent leaded		.07¼ @	.07¾
10 per cent lead sulphate	lb.	.07 @	.07½
20 per cent lead sulphate	lb.	.07 @	.07½
35 per cent lead sulphate	lb.	.07 @	.07½

(Also see whites)

MINERAL RUBBER

Gilsonite	ton	70.00 @	—
Genasco (factory)	ton	50.00 @	—
Hard hydrocarbon	ton	32.00 @	45.00
Soft hydrocarbon	ton	30.00 @	35.00
Pioneer M.R.	ton	42.00 @	44.00
320 M. P. hydrocarbon (c. l. factory)	ton	47.50 @	50.00
300/310 M. P. hydrocarbon (c. l. factory)	ton	42.50 @	45.00
Synpro, granulated, M.R. (factory)	ton	59.50 @	65.00

SOFTENERS

Acids

Acetic, 28 per cent	cwt.	2.50 @	3.00
Carbolic (phenol)	lb.	.12½ @	.16
Cresylic, 97 p.c.	lb.	.53 @	.55
95 p.c.	lb.	.48 @	.53
Muriatic, 20 degrees	cwt.	1.10 @	1.25
Nitric, 36 degrees	cwt.	5.00 @	6.00
Sulphuric, 66 degrees	ton	17.00 @	17.50
60 degrees, bulk	ton	11.00 @	12.00
Tartaric, crystals	lb.	.30 @	—

Alkalies

Caustic soda, 76 p.c.	cwt.	3.60 @	4.00
Soda ash, 58 p.c.	cwt.	2.20 @	2.25

Oils

Castor, No. 3, bbls.	lb.	.10½ @	—
Corn, crude, bbls.	lb.	.11 @	.25
refined	lb.	.13 @	—
Chinawood, bbls.	lb.	.13½ @	.13¾
Cottonseed,	lb.	.09½ @	.10
Glycerine, drums	lb.	.15 @	.16
Linseed, domestic	lb.	.86 @	—
imported	lb.	.80 @	.80
Palm, Niger	lb.	.06¼ @	.06⅞
Lagos	lb.	.07¾ @	.08
Peanut, domestic, crude	lb.	.11½ @	.12
Pine, steam distilled over 930° sp. gr.	gal.	1.00 @	—
Rapeseed, refined	gal.	.83 @	.84
blown	gal.	.92 @	.95
Rosin, first rectified	gal.	.37 @	—
second rectified	gal.	.39 @	—
Tar, commercial	gal.	.31½ @	—
Soya Bean, crude, bbls.	lb.	.11¼ @	.11⅓
" " refined	lb.	.11¾ @	.12

Resins and Pitches

Cumar resin, hard	lb.	.09 @	.12
Cumar resin, soft	lb.	.09 @	.12
Tar, retort	bbl.	9.00 @	—
kiln burned	bbl.	10.00 @	—
Pitch, Burgundy	lb.	.05 @	.06
coal tar	ton	.01½ @	—
pine tar		.03½ @	—
Rosin, grade K	bbl.	5.35 @	—
Strained	bbl.	6.00 @	—
Shellac, fine orgaue	lb.	.85 @	—

Solvents

Acetone, drums,	lb.	.08 @	.11
Alcohol, denatured, No. 1 bbls.	gal.	.30 @	.31
Methyl, 95 per cent, drums	gal.	.52 @	—
Ethyl, 190 proof, bbls.	gal.	4.70 @	4.80
Benzol, 90 per cent	gal.	.27 @	.32
pure	gal.	.32 @	.34
Carbon bisulphide,	lb.	.06 @	.07
tetrachloride	lb.	.09½ @	.11½
Dimethylaniline	lb.	.35 @	—
Motor gasoline, steel bbls.	gal.	.34 @	—
Toluol, pure	gal.	.30 @	.35
Turpentine, spirits	gal.	.84 @	.90
wood	gal.	.78 @	.80
Xylol, pure	gal.	.45 @	.51
commercial	gal.	.31 @	.38

Waxes

Beeswax white, pure	lb.	.45 @	—
Caranuba, No.	lb.	.16 @	—
Ceresin, white	lb.	.09 @	.10
Bayberry	lb.	.21 @	.22
Montan, crude	lb.	.04½ @	.05
Ozokerite, black,	lb.	.20 @	.23
Paraffine	lb.	.25 @	—
Petrolatum, amber, bbls.	lb.	.04½ @	—
dark amber,	lb.	.04 @	—

SUBSTITUTES

Black	lb.	.08 @	.14
White	lb.	.09 @	.16
Brown	lb.	.11 @	.14
Brown factice	lb.	.08 @	.15½
White factice	lb.	.08½ @	.15½

VULCANIZING INGREDIENTS

Lead, black hyposulphite (black hypo)	lb.	.42 @	—
Orange mineral, domestic	lb.	.11 @	.13
Sulphur chloride (jugs)	lb.	.20 @	—
Sulphur flour pure	bbl.	2.60 @	3.10
Bergenport pure	cwt.	2.55 @	—
superfine, 99½ p.c.	bbl.	2.40 @	2.90

Zinc Oxide—The demand is steadily improving and tire and rubber manufacturers are buying freely. The activity in this market is much greater than at this time last year and prices are well established. The undertone of the market is very strong. Quotations follow: French process red seal, 8¾ @ 9¼ cents; green seal 9¾ @ 10¼ cents; commercial, lead free, 7½ @ 8½ cents; 5 per cent lead sulphate, 7½ @ 7¾ cents; 10, 20 and 35 per cent lead sulphate, 7 @ 7½ cents.

Barytes—Buying is much better and there is a strong undertone to the market situation. There was no change in the quoted price of Western barytes which continues at $23 f.o.b. works, including package. It is not thought that the proposed tariff of $10 a ton will have any effect on prices if enacted into the law.

Carbon Bisulphide—Supplies were in good volume and the demand was very active from the rubber trade. Prices held steady at 6 to 7 cents per pound according to quality.

Carbon Tetrachloride—What little demand there was came from the rubber trade. Prices remained unchanged at 9½ to 11½ cents per pound according to quantity.

Dimethylaniline—There has been more activity in this commodity since prices were lowered. Supplies seem to be in good volume. Quotations were from 35 to 38 cents per pound.

Beta-Naphthol—There has been little demand and prices eased off quotations being made at 25 to 27 cents per pound according to seller.

Aniline Oil—There was no variation from the quotations prevailing during the previous period. Stocks seem to be in abundance and the demand very small. Most producers held the price at 16 cents per pound but there were reports that some lots were sold at 15½ cents.

Phenol—Government agents were offering this commodity at 12 cents per pound but consumers were not at all satisfied with the quality. Fairly good business was done by producers at 13 cents and some sales were made as high as 13¼ cents.

Benzol—Leading refiners have not changed their prices which continue at 32 at 34 cents per gallon for pure and 27 at 32 cents for 90 per cent. Resale 90 per cent brought 40 cents.

Litharge—There was an advance of ¼ cent a pound for litharge in casks since the last period. The call for this product, as for all lead oxides, has been much better and producers look for a still greater improvement. The demand from rubber manufacturers continues in good form. Quotations follow: casks, 7¾ cents per pound; 100 pound kegs less than 500 pounds, 12¼ cents; 500 to 2000 pounds, 11 cents; 2000 to 10,000 pounds, 10.55 cents.

Lithopone—The demand has been heavy and some producers are working at capacity day and night, to keep up the supply. There has been some talk of an advance of ¼ cent a pound for domestic after July 1. There have been heavy imports of foreign material because of tariff prospects. Prices continued at 6 cents per pound in bags; 6¼ cents in barrels, carlots and 6½ cents, in barrels, less than carlots.

Palm Oil—There were no important sales but a somewhat better inquiry. Supplies are light and prices continued at 7¾ to 8 cents per pound for Lagos and 6¼ to 6½ cents per pound for Niger.

Crude Rubber

NEW YORK, MAY 3, 1922

During the three weeks since our last report the crude rubber market has remained almost stationary. For a few days during the latter part of April prices for Spot Ribbed Smoked Sheets and First Latex moved up to 16½ cents and at the moment have fallen off to 16 cents.

Prices on the Amber crepes have moved up ½ cent and are in good demand. Some Para grades also show slight increases.

The manufacturers still continue uninterested in either spot or forward positions in any sizable weights that would exercise a stimulating effect on the market. Most of the trading that has been going on has been confined to dealers and professionals. The conservative attitude of manufacturers is undoubtedly due to the large importations that have arrived in the country since the first of the year.

Stocks at London remain at about 67,000 tons which is not greatly in excess of the stocks at that point at the corresponding period last year. This rubber is firmly held, but all realize that any considerable improvement in the general situation must come from the manufacturing industry in the United States.

It is now estimated in London that the surplus on January 1, 1923, will be equal to a year's production and it is further said that all trees on the plantations will come into bearing in 1924. Such comments do not take into consideration the restriction in output which is already coming about on account of prices being so far below the cost of production.

It is reported from Malaya that a large number of Chinese planters have already gone out of business, and that many estates must do likewise unless prices advance to somewhat higher levels.

Current quotations on this date are as follows:

Plantations			
Ribbed Smoked Sheets spot	.15⅝	@	.16
June	.16	@	.16¼
May/June	.16¼	@	.16½
July/Sept.	.16½	@	.16¾
July/December	.17	@	.17¼
October/December	.17½	@	.17¾
Smoked sheets plain, spot	.14¼	@	.14½
First Latex Pale Crepe, spot	.15¾	@	.16
June	.16	@	.16¼
May/June	.16¼	@	.16½
July/Sept.	.16½	@	.16¾
July/Dec.	.17	@	.17¼
October/December	.17½	@	.17¾
Amber Crepe No. 1	.15¾	@	.16
" " " 2	.15¼	@	.15½
" " " 3	.14¾	@	.15
Light clean thin brown, Crepe	.15	@	.15¼
Clean Thin Brown Crepe	.14¾	@	.15
Commercially Clean thin brown crepe	.13¾	@	.14
Roll Brown Crepe spot	.13½	@	.13¾
May/June	.13½	@	.13¾
Paras			
Madeira Fine	.20¾	@	.21
Acre Fine	.19½	@	.19¾
Up-river Fine	.18¾	@	.19
Up-river Medium	.17¼	@	.17½
Up-river Caucho ball (shipment)	.14	@	.14½
Up-river Coarse	.13	@	.13½
Islands Fine	.17½	@	.18
Islands, Medium	.16½	@	.17
Islands Coarse	.09	@	.09½
Cameta	.09½	@	.10
Xingu Ball	.11¼	@	.11½
Tapajos fine, spot	.17	@	.17½
Pontianac			
Prime Pressed	.12¾	@	.13
Plantation	—	@	.06
Bangermassin	—	@	.07
Palembang	—	@	.08¼
Siak Gutta Percha	.16½	@	.17
Prime Macassar	2.75	@	2.85
Balata			
Panama Block	.30	@	.40
Surinam Sheets	.65	@	.67
Columbia Block	.42	@	.43
Venezuela Block	.50	@	.52

Reclaimed Rubber

NEW YORK, MAY 3, 1922

The continued firmness of the crude rubber market and the general revival of production in the industry have confirmed the optimistic feeling now prevalent among reclaimers. Although new orders for considerable quantities of any grade are scarce, the reclaiming plants are producing at about one-quarter capacity; the output of most of the plants is largely confined to the better grades.

Quotations, which remain practically unchanged, since our last report, are nominally as follows:

Standard Reclaims			
Floating	$.12	@	$.13
Friction	.12	@	.13
Boots and Shoes	.09	@	.10
Boots and Shoes (washed)	.13	@	.14
Mechanical	.08	@	.10
Hose	.10½	@	.11½
Tires, truck	.09	@	.10
Tires, auto	.09	@	.10
White	.13	@	.14

Scrap Rubber

NEW YORK, MAY 3, 1922

The temporary activity in the scrap rubber market in one or two grades has eased off in the past fortnight. Scrap rubber dealers have plenty of stock available but mills in the East are using very small quantities of a few grades. Practically all orders reported by the large dealers are being placed by Middle West reclaimers.

Boots and shoes continue to decline in price as stocks grow larger.

Quotations of this date (per pound in carload lots delivered) are as follows:

Auto tire peelings	.01⅛	@	.01¼
Standard White auto	.01	@	.01⅛
Mixed auto	.00½	@	.006/10
Bicycle tires	.00½	@	.00⅝
Clean solid truck tires	.00⅜	@	.00⅞
Boots and shoes	.02⅛	@	.02⅜
Arctics, trimmed	.00¾	@	.02
Arctics, untrimmed	.01	@	—
Inner tubes, No. 1	.03	@	.03⅛
Inner tubes, compounded	.02½	@	.02⅝
Battery jars, black compounded	Nominal		
Battery jars No. 1 bright fracture	Nominal		
Inner tubes, red	.02⅝	@	.02⅜
Heels and pads	Nominal		
Black mixed	.00¼	@	.00⅜
Garden hose	.00½	@	.00⅝
Air brake hose	.00½	@	.00¾
Red packing	.01	@	.01¼
Red mixed rubber	.01¾	@	.02
White mixed rubber	.01¾	@	.02

American Rubber Patents

1,412,076—George C. Wood, Winthrop, Mass., assignor to Wids Company of St. Paul, Minn. Rubber Heel.

1,412,601—William Beaney, New York. Tire.

1,412,682—John Alfred Gerome, Kitchener, Ontario, Canada. Tire.

1,412,535—William C. Martin, Chicago, Ill. Pneumatic Tire and Its Manufacture.

1,412,492—Benjamin C. Seaton, Nashville, Tenn. Pneumatic Tire.

1,412,326—William Erastus Williams, Chicago, Ill. Method of Preparing Bases For Rubber Tires and Other Purposes.

1,412,119—Henri Pierre Laurent Laussucq, Reading, Pa., assignor to Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa. Vulcanizing Press.

1,411,447—Charles J. Matt, Toledo, Ohio. Tire.

1,411,516—George Reider, Los Angeles, Calif. Tire.

1,411,671—Fred J. Schrank, Akron, Ohio, assignor to The Swinehart Tire & Rubber Co., Akron, Ohio. Tire.

1,411,915—Patrick P. Grosso, Brooklyn, New York. Tire Construction.

1,411,922—Francis McFadden, Baltimore, Md. Demountable Solid-Tire Construction.

1,411,588—Frederick A. Schultz, Hasbrouck Heights, N. J. Pneumatic-Tire-Making Machine.

1,412,006—Clarence H. Jones and Charles Schulz, Hordville, Nebr. Nonskid Tire.

1,411,506—Anders John Astberg and Albert Kenny, Richmond, near Melbourne, Victoria, Australia, assignors to the Standard Rubber Works Proprietary Ltd., Melbourne, Australia. Resilient Tire.

1,411,672—Fred J. Schrank, Akron, Ohio, assignor to The Swinehart Tire & Rubber Co., Akron, Ohio. Method and Apparatus For Making Tires.

Trade Marks Applied For

[The following are trade-mark applications pertinent to our field pending in the United States Patent Office which have been passed for publication and are in line for early registration unless opposition is filed promptly. For further information address National Trade-Mark Company, Barrister Building, Washington, D. C. or Bush Building, 130 West 42 Street, New York, trade-mark specialists. As an additional service feature to its readers this Journal gladly offers to them an advance search free of charge on any mark they may contemplate adopting or registering.]

WEARITE—No. 156,189 Essex Rubber Company, Trenton, N. J. For rubber soles and heels.

POLL-PARROT within an oval with picture of a parrot perched on either side—No. 150,617. International Shoe Co., St. Louis, Mo. For shoes for men, women, and children, made of leather, rubber, fabric, or the combination thereof.

PEDICLINIC with letter "C" on outline of a foot in center—No. 149,357. Val Richter, Washington, D. C. For shoes and slippers of leather, rubber, fabric, and combinations.

CAVALIER—No. 156,898. Hyman Gordon, New York, N. Y. For boots, shoes, leggings, spats, rubbers, gaiters, and overshoes, each of said articles of goods being either of leather, rubber, fabric, or of combination of the said materials.

STUTZ STREAMLINE SHOES—No. 156,982. Fergus A. Butler, New York, N. Y. For shoes of leather, rubber, fabric, and combinations thereof.

BRUNSWICK—No. 107,101. The Brunswick-Balke-Collender Company, Wilmington, Del., and Chicago, Ill. For rubber or rubber and fabric tires and tubes for vehicles.

ABBOTT SHOE CO., within rim of circle and letter "A" in center, surmounted by two wings—No. 156,730. Abbott Shoe Co., North Reading, Mass. For boots, shoes, and slippers made of leather, rubber, fabric, and leather and rubber, and rubber and fabric, and leather and fabric.

PICTURE of an arbitrarily-placed narrow white band around the upper edge of a piece of foot-wear.—No. 156,150. Converse Rubber Co., Boston, Mass. For rubber shoes, overshoes, lumber-men's boots and rubbers.

NOVO—No. 154,063. Nova Heel Manufacturing Co., Berkeley, Calif. For heels of rubber and leather in combination.

New Incorporations

ALABAMA

The A. and M. Tire Company, Inc., to deal in tires. $3.000. Incorporators: Marshall L. Hussey, Earl Morrison and Truman Morrison.

CONNECTICUT

United Cycle Co., Inc., to deal in tires. $15,000. Incorporators: R. Berardi and J. B. Berardi, 186 West Liberty street, Bridgeport, Conn.; A. Massaro, 402 South avenue, Bridgeport, Connecticut. Principal office, 570 State street, Bridgeport, Connecticut.

DELAWARE

Collins & Co., to manufacture tire tubes and shoes for automobiles. $100,000. Principal office, Wilmington, Delaware.

Denman Cord Tire Co., to manufacture tires, tubes, etc. Incorporators: A. H. Shapiro, New York; R. H. Johnson, Edgemere, N. Y.; John A. Morris, Westchester, N. Y.; Frank Fritts, South Beach, Conn. Agents: Registrar and Transfer Company.

Philip S. Malickson, to manufacture tires. $100,000. Principal office, Philadelphia, Pennsylvania. Agent, Corporation Guarantee and Trust Company.

United Tire Stores, to manufacture tubes, $20,000. Incorporators: J. C. Wolf, H. J. Ketnes, Edith E. Wolf—all of Bradford, Pennsylvania. Agent, Corporation Service Company.

Better Tires Corporation, to manufacture tires. $2,000. Principal office, Philadelphia, Pennsylvania. Agent, Corporation Guarantee and Trust Company.

Kerwool Tire Stores Co., to deal in tires, $20,000. Incorporators: J. C. Wolf, H. J. Kernes, Edith E. Wolf—all of Bradford, Pennsylvania. Agent, Corporation Service Co., Wilmington, Delaware.

Naugatuck Tire & Rubber Co., to manufacture tires. $1,500,000. Principal office, Wilmington, Delaware. Agent, Corporation Service Company.

Flexite No-Air Tire Co, to manufacture tires $500,000. Principal office, Wilmington, Delaware. Agent, Corporation Trust Company of America.

United Tire Stores Inc., to manufacture and deal in tubes. $20,000. Incorporators: J. C. Wolf, H. J. Ketnes and Edith E. Wolf—Bradford, Pennsylvania. Principal office, Bradford, Pennsylvania. Agent, Corporation Service Co., Wilmington, Delaware.

FLORIDA

The Simkins Tire Co., to deal in tires, tubes etc. $20,000. E. G. Simpkins, president; C. T. Chase, vice president; Herbert Lamson, secretary and treasurer. Principal office, Jacksonville, Florida.

ILLINOIS

Tire and Replacement Company, to manufacture and deal in tires and tubes. $20,000. Incorporators: J. T. Cantor, 249 East 50th Place; B. Friedman, 2433 Luella avenue; S. Simon, 2244 West Walton street—Chicago, Illinois.

Shein Tire Corporation, to deal in tires. $5,000. B. Shein, president, 4936 Bernice avenue; S. Goodman, vice president, 1519 South Kedzie avenue; H. J. Bloom, secretary and treasurer, 1238 South Spalding avenue—Chicago, Illinois.

Tire and Replacement Co., of North America, to deal in tires. $20,000. Incorporators: J. T. Cantor, 649 E. 50th street; B. Friedman, 2433 Luella avenue; S. Simon, 2244 West Walton street—Chicago, Illinois. Principal office, Chicago, Illinois.

Rex Tire and Rubber Co., to manufacture and sell tires, tubes etc. $10,000. Incorporators: A. I. Epstein, R. Epstein, 3509 Douglas Boulevard; S. S. Byron, 1305 South Michigan avenue—Chicago, Illinois. Principal office, 1305 South Michigan avenue, Chicago, Illinois.

MASSACHUSETTS

The General Tire Co., to deal in tires, tubes etc. $100,000. Incorporators: Edgar C. Newcomb and Joseph M. Everett of Brookline and Albert L. Banks of Somerville, Boston, Massachusetts. Principal office, Boston, Massachusetts.

Meade Rubber Co., to manufacture rubber goods. $150,000. Principal office, Stoughton, Massachusetts.

Westfield Tire & Rubber Co., to manufacture and deal in tires, etc. $15,000. E. G. Martel, president; W. J. Poirier, treasurer—both of Westfield, Massachusetts. Principal office, Springfield, Massachusetts.

MISSOURI

The Poplar Bluff Rubber Co., to manufacture rubber goods. $100,000. Principal office, Poplar Bluff, Missouri.

NEW JERSEY

The Kroydon Company, to manufacture and sell golf balls. $500,000. Incorporators: A. A. Kreuter, C. L. Gairod and G. Norris—563 18th avenue, Newark, New Jersey. Principal office, 563 18th avenue, Newark, New Jersey. Agent, A. A. Kreuter, Newark, New Jersey.

Rubber Products Industries Inc., to manufacture rubber products. $2,000,000. Incorporators: E. J. Spitzer, Derby, Connecticut; G. F. Long, Kearney, New Jersey; J. W. Teeple, Newark, New Jersey. Principal office, 207 Market street, Newark, New Jersey.

NEW YORK

Kupperman Bros., to manufacture tires. $5,000. Incorporators: W. W., H. P. and H. C. Kupperman, Syracuse, New York. Attorney, W. Weisberg, Syracuse, New York.

Chautaugua Products Co., to manufacture rubber products. $10,000. Incorporators: W. A. Stolltzing, A. W. Jackson, F. M. Garfield. Attorneys, Mott & Ottaway, Jamestown, New York. Principal office, Jamestown, New York.

Annabelle Mfg. Co., to manufacture rubber products. $100,000. Incorporators: N. Vaeth, L. & O. Kallfelz. Attorneys, Shea & Crimmins, Syracuse. Principal office, Syracuse, New York.

The Tire Shop, Inc., to deal in tires, etc. $50,000. Incorporators: C. H. Rork, F. P. Moynehan and N. R. Tarrunt—all of Glens Falls. Principal office, Glens Falls, New York.

Martin Sales Company, to manufacture rubber heels, etc. $15,000. Incorporators: David Martin, Gloversville, New York, William S. Martin and L. I. Martin—Troy, New York. Principal office, Troy, New York.

Queen Shield & Rubber Co., to manufacture rubber goods. $25,000. Incorporators: A. Famely, 458 West Broadway; I. Hansen, 558 West 181st street; A. B. Albert, 305 Broadway—New York City. Principal office, 458 Broadway, New York City.

OHIO

The Summit Rubber Co., to manufacture rubber goods. $125,000. Incorporators: Morris, N. Nobil, David M. Siff, Chas E. Schwartz, Geo. B. Nobil and Isador B. Nobil. Principal office, Columbus, Ohio.

Brubaker Tire & Rubber Co., to manufacture and sell tires, tubes etc. $400,000. Incoporators: William A. Brubaker, Gustav A. Elfers, Irving M. Elfers, William E. Snyder and F. E. Shannon.

The Knox Tire & Rubber Co., to manufacture and deal in tires, tubes etc. $400,000. Principal office, Mt. Vernon, Ohio.

The M. & O. Rubber Co., to manufacture rubber goods. $500. Incorporators: Mary H. Moler, W. C. Owen, J. C. Meek, Elden Meek and J. A. Meek. Principal office, Salem, Ohio.

The Sumatra Rubber Specialties Co., to deal in rubber goods. $10,000. Principal office, Salem, Ohio. Agent, E. G. Hachtel, Salem, Ohio.

Capital Increases

Union Rubber Products Corporation, New York, increased from $5,000 to $25,000.

New York Rubber Co., New York, increased from $500,000 to $800,000.

Name Changes

Liberty Airless Tire Corporation to Liberty Tire Corporation, Cary, Ohio.

Kolman Tire & Rubber Co., New York, to Keystone Tire Sales Co., No. 15.

Dissolutions

McKenna Rubber Co., Schenectady, New York.

THE RUBBER AGE BUYERS GUIDE

ACCELERATORS
Daigger, A., & Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., The, Cleveland, O.
Rubber Service Laboratories Co., The, Akron, O.
States Metals Co., Inc., New York.
Wishnick-Tumpeer Chemical Co., Chicago.

ACCUMULATORS
Adamson Machine Co Akron, O.
Akron Rubber Mold & Machine Co., Akron, O.
Allen Machine Co., Erie, Pa.
Birmingham Iron Foundry, Derby, Conn.
Farrel Foundry & Machine Co., Ansonia, Conn.
Wellman - Seaver - Morgan Co., Cleveland, Ohio.

ACIDS
Daigger, A., & Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., Cleveland, O.
National Aniline & Chemical Co., Inc., New York.
Wishnick-Tumpeer Chemical Co., Chicago.

ACID TANKS
Birmingham Iron Foundry, Derby, Conn.
Devine, J. P., Co., Buffalo, N. Y.
Farrel Foundry & Machine Co., Ansonia, Conn.

AIR & STEAM METAL BAGS
Allsteel Ridewell Tire & Rubber Co., Dayton, Ohio.

AIR BRAKE HOSE
United States Rubber Co., New York.

AIR GOODS
Davol Rubber Co., Providence, R. I.
Hodgman Rubber Co., Tuckahoe, N. Y.
United States Rubber Co., New York.

AIR MATTRESSES
Davol Rubber Co., Providence, R. I.
Hodgman Rubber Co., Tuckahoe, N. Y.
United States Rubber Co., New York.

AIRPLANE AND BALLOON CLOTHS
United States Rubber Co., New York.
Hodgman Rubber Co., Tuckahoe, N. Y.

ALBA WHITING
Daigger, A., & Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., Cleveland, O.
Industrial Chemical Co., New York.
Wishnick-Tumpeer Chemical Co., Chicago.

ALCOHOL
Daigger, A., & Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., Cleveland, O.
Tyler Patterson Co., Clev'd, O.
Wishnick-Tumpeer Chemical Co., Chicago.

ALUMINUM FILLER
Daigger, A., & Co., Chicago, Ill.
Wishnick-Tumpeer Chemical Co., Chicago.

ALUMINUM FLAKE
Aluminum Flake Co., Akron, Ohio.
Butcher, L. H., Co., New York.
Fulper, Edward B., Trenton, N. J.
Harshaw, Fuller & Goodwin Co., Cleveland, O.
Rubber Service Laboratories Co., The, Akron, O.

AMMONIA AQUA
Daigger, A., & Co., Chicago, Ill.
Laidlow, Kelly & Co., New York.
Tyler Patterson Co., Clev'd, O.
Wishnick-Tumpeer Chemical Co., Chicago.

ANGLE THERMOMETERS
Taylor Instrument Companies, Rochester, N. Y.

ANILINE OIL
Butcher, L. H., Co., New York.
Daigger, A., & Co., Chicago, Ill.
Fulper, Edward B., Trenton, N. J.
Klipstein, A., & Co., New York.
National Aniline & Chemical Co., Inc., New York.
Tyler Patterson Co., Clev'd, O.
Wishnick-Tumpeer Chemical Co., Chicago.

ANILINE OIL PLANTS
Devine, J. P., Co., Buffalo, N. Y.

ANTIMONY, SULPHURETS
Butcher, L. H., Co., New York.
Daigger, A., & Co., Chicago, Ill.
Fulper, Edward B., Trenton, N. J.
Harshaw, Fuller & Goodwin Co., Cleveland, O.
States Metals Co., Inc., New York.
Rare Metal Products Co., Belleville, N. J.
Tyler Patterson Co., Clev'd, O.
Typke & King, Mitcham, England.
Wishnick-Tumpeer Chemical Co., Chicago.

APRONS—RUBBER
Hodgman Rubber Co., Tuckahoe, N. Y.
Miller Rubber Co., Akron, Ohio.

ARTIFICIAL RUBBER
Carter Bell Mfg. Co., New York.
Stamford Rubber Supply Co., Stamford, Conn.

ASBESTINE
Butcher, L. H., Co., New York.
Daigger, A., & Co., Chicago, Ill.
Fulper, Edward B., Trenton, N. J.
Harshaw, Fuller & Goodwin Co., Cleveland, O.
Tyler Patterson Co., Clev'd, O.
Wishnick-Tumpeer Chemical Co., Chicago.

ATOMIZERS
The Rubber Products Co., Barberton, Ohio.

AUTOCLAVES
Devine, J. P., Co., Buffalo, N. Y.

AUTOMOBILE COATS
Hodgman Rubber Co., Tuckahoe, N. Y.
United States Rubber Co., New York.

AUTO TOP FABRICS
Hodgman Rubber Co., Tuckahoe, N. Y.
Taylor, Armitage & Eagles, Inc., New York.
Turner Co., J. Spencer, New York.
United States Rubber Co., New York.

BALATA
Wood, Charles E., New York.

BALATA FILM (Colorless)
Peters Bros. Rubber Co., N. Y.

BALLOON FABRICS
United States Rubber Co., New York.

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FABRICS

JENCKES
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